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Draft Environmental Impact Statement

Johnson Bar Fire Salvage Draft EIS

Nez Perce/Clearwater National Forests
Moose Creek Ranger District
Idaho County, Idaho

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CHAPTER 1

PURPOSE AND NEED FOR ACTION

This chapter discusses current and desired conditions, purpose and need for action, the Proposed Action, management direction, scope of the analysis, availability of project files, and the organization of the Environmental Impact Statement.

1. Introduction

The Nez Perce-Clearwater National Forest is proposing project activities, to include the salvage harvest of fire killed timber and road decommissioning, within the Johnson Bar Fire Salvage proposed project area in order to recover economic value, achieve desired age and size classes, trend tree species composition towards more resilient species, and to reduce road related impacts to aquatic species and the watersheds.

2.1. Project History

On August 3, 2014 the Johnson Bar wildfire started as a result of lightning and escaped initial attack. The fire burned over 13,000 acres in the Middle Fork Clearwater River and Lower Selway Watersheds, more specifically along Swiftwater, Elk City, Goddard, Lodge, Decker, and O'Hara creeks. The majority of the acres affected by the fire burned on National Forest administered lands (11,369 acres), with 18 acres of riparian areas, 314 acres on State of Idaho Lands, and 76 acres on private lands (see Map 1).

Initial attack fire crews attempted to contain the fire for a number of days; however, due to the extreme fuel loadings, a product of increasing insect and disease mortality, and fire intensity forced firefighters to back away from directly fighting the fire and instead attempt an indirect approach. A Type 2 Incident Management Team was brought in to manage the fire on August 9, 2014 and began indirect line construction; however, due to a lack of control options, dense forests, and extreme fuel loadings, coupled with several wind events, the fire was able to spread rapidly and uncontrollably.

The fire resulted in widespread tree mortality, particularly within the mixed conifer/western redcedar-grand fir stands. Prior to the fire, the Forests were either developing or analyzing forest or watershed restoration projects for under the Collaborative Forest Landscape Restoration Program (CFLRP).

Congress established the CFLRP with Title IV of the Omnibus Public Land Management Act of 2009. In addition to encouraging the collaborative, science-based ecosystem restoration of priority forest landscapes, the CFLRP has the following program goals:

- Encourage ecological, economic, and social sustainability;
- Leverage local resources with national and private resources;
- Facilitate the reduction of wildfire management costs, including through reestablishing natural fire regimes and reducing the risk of uncharacteristic wildfire;

- Demonstrate the degree to which various ecological restoration techniques achieve ecological and watershed health objectives;
- Encourage utilization of forest restoration by-products to offset treatment costs, benefit local rural economies, and improve forest health.

The CFLRP established a fund to be used for restoration work on priority landscapes. Up to $4 million annually can be requested by selected projects. The Clearwater Basin Collaborative (CBC), in partnership with the Nez Perce-Clearwater Forests, developed and submitted a comprehensive restoration proposal, the Selway–Middle Fork Clearwater project, in 2010 (CBC and Forest Service 2010). The Selway–Middle Fork Clearwater project was selected for funding by the Secretary of Agriculture in August 2010.

Projects that the Forests were analyzing or planned to develop in the fire affected area were generally proposing to utilize commercial timber harvest to restore natural fire regimes, create a balance of age classes across the landscape, restore more resilient tree species and reduce fuel loads to prevent large uncontrollable wildfires. . . . Merchantable timber generated would meet local and regional needs, as well as produce funds for the Forests to invest in future restoration work.

As a result of the fire, the EIS for the Middle Fork Vegetation Management Project, scoped in January, 2014 has been *cancelled.* The O'Hara-Goddard Project, which was in development, has been incorporated in part into the proposed action of the Johnson Bar Fire Salvage Project.

Desired conditions for the Johnson Bar Fire Salvage proposed project area Johnson Bar Fire Salvage proposed project area were developed using the Nez Perce National Forest Plan (Forest Plan) (USDA Forest Service 1987a) direction; broad-scale assessments [e.g., Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin (USDA Forest Service 1997) and the Selway and Middle Fork Clearwater Rivers Subbasin Assessment (USDA Forest Service 2001)]; and the best science currently available. The scoping process was started in January 2014 for the Johnson Bar Fire Salvage project.

2.2. Proposed Project Area

The approximately 26,800-acre proposed project area is located south and west of Lowell, Idaho within the Middle Fork Clearwater River and Lower Selway Watersheds in Idaho County, Idaho, and would include the Swiftwater, Elk City, Goddard, and O'Hara Creeks. The river corridor within this area is classified as a "recreation" segment of the Middle Fork Clearwater Wild and Scenic River System.

The proposed project would be located in portions of Township (T.) 32 North (N.) Range (R.) 7 East (E.), T.32N., R.6E., T.31N., R.7E., and T.31N., R.6E., Boise Principle Meridian. Access would be via Forest Roads #470 (Swiftwater), #9723 (Hotpoint), #1121 (Goddard Point), #9701 (Peterson Point), and #653.

There are no Wilderness Areas, Idaho Roadless Areas, or Research Natural Areas within the proposed project area.

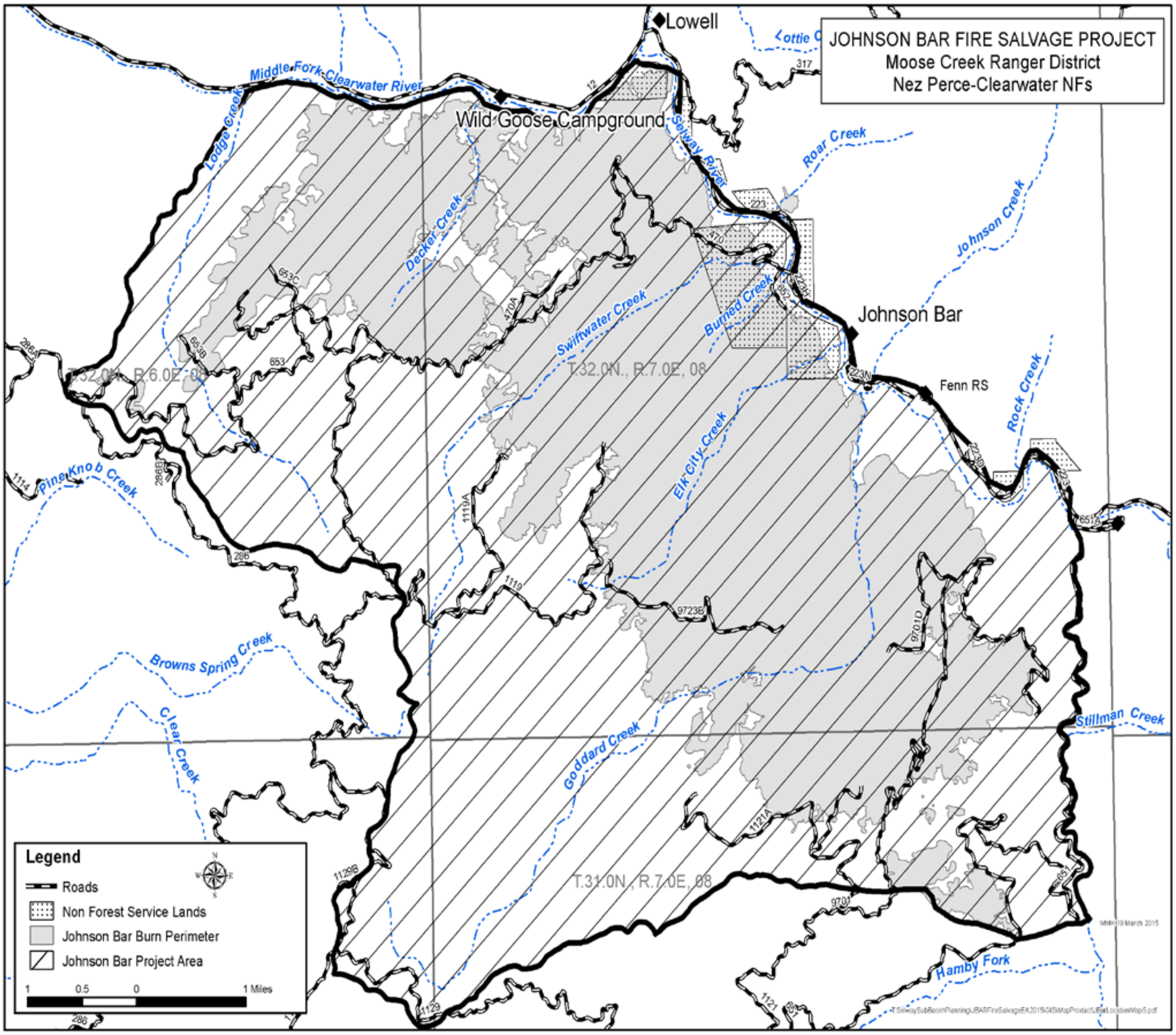
The Johnson Bar Fire Salvage project is 26,788 acres with the management areas listed below in Table 1-1.

Table 1-1: Management Areas within the Project Area

Management Area	Description of Management Area	Management Area in Johnson Bar Acres
01	Public Safety	25
8.2	Wild and Scenic River	2,308
10	Water	942
12	Timber	10,508
14	Timber/Big Game Visuals	8
16	Elk	9,929
17	Timber/Visuals	2,357
20	Old Growth	1,867
21	Moose	812
Total		26,788

* Discrepancies in acres are due to GIS operations and rounding

Map 1: Proposed Project Area

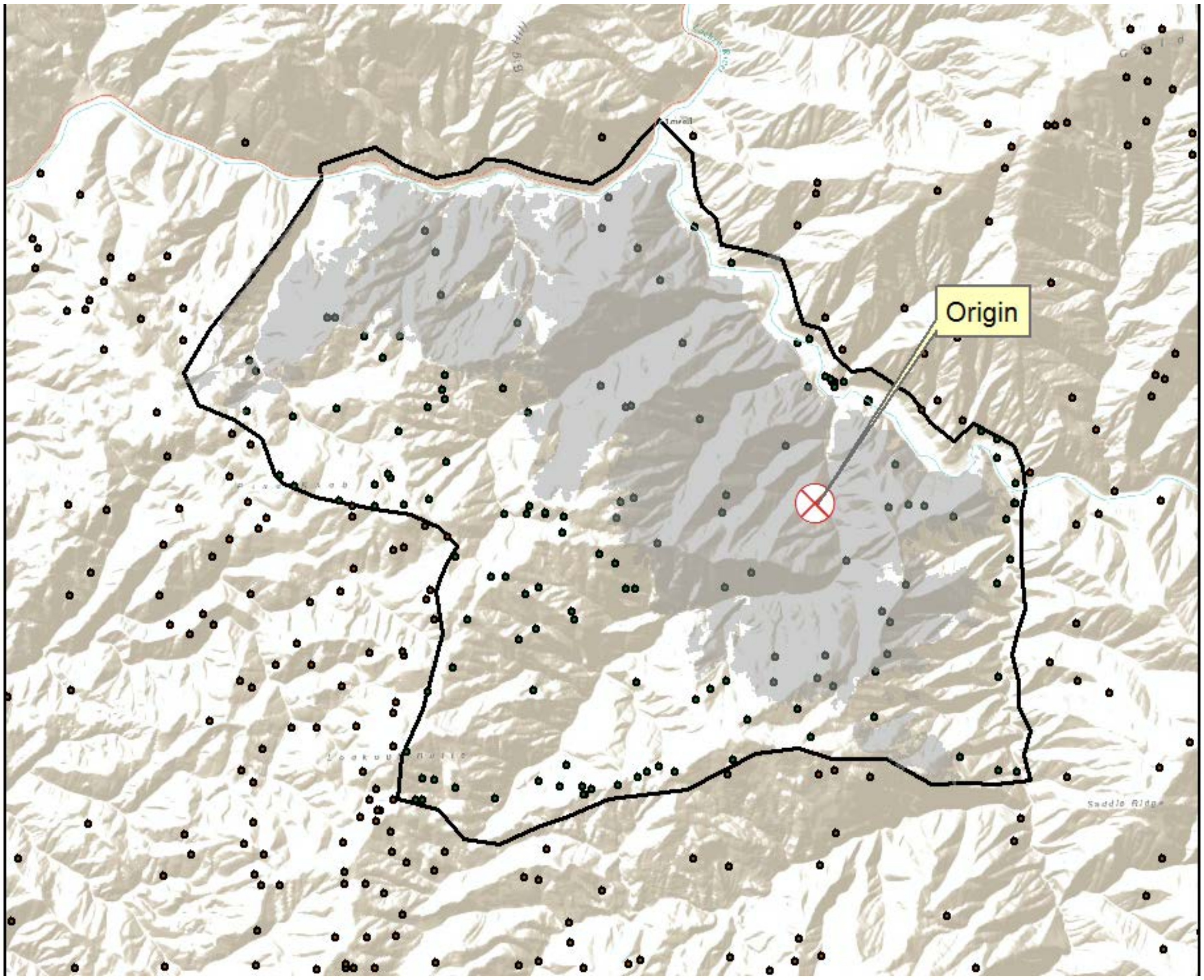


2.2.1. Fire Occurrence, History, and Risks

Forests in the western United States are unhealthy due to high fuel build ups caused by bark beetle mortality (Western Governors' Association Forest Health Advisory Committee, 2008) (USDA Forest Service, 2004). Interactions of natural disturbance cycles, such as fires, wind events, insects, and disease can have cascading interactions leading to reduction in the number of old trees and shade tolerant species with thin bark. Natural successional processes, along with agents of change, have followed a natural trajectory. Trees grow and become dense and overstocked. Root rot has weakened trees allowing them to become susceptible to Douglas-fir tussock moth, Douglas-fir bark beetles, and mountain pine beetles. The tussock moth tends to attack trees with the most foliage, whereas, the Douglas-fir beetles and mountain pine beetles tend to attack larger, less vigorous trees [(Weatherby and Their) as cited in Kegley 2004] (USDA, 2004). Root rot, insects, and wind-blown trees have resulted in large volumes of fuel (Tappeiner *et al*., 2007). In some cases, insect infestations may have contributed to large fires (USDA Forest Service 1998a). Recently, increased fuels have led to increased fire intensity (Jenkins, Runyon, Fettig, Page and Bentz, 2014).

Historically fires were the primary disturbance factor that shaped the composition and structure of the forests in the project area (See Map 2). In the period ranging from 1970 through 2013, there were 180 reported fires within the project area (See Map 2). Only three were larger than an acre: 2, 10, and 15 acres respectively.

The project area is characterized as a mixed severity fire regime (Smith, 1997) which is consistent with the pattern of the Johnson Bar fire (See Map 1.) Up to 90% percent of the surface fuels are in the greater than 3-inch category. Since the late 1880s, the total landscape acreage burned is approximately 15, 100 acres, or about 52% of the project area. Counting areas that have reburned at least once the total overall acres are approximately 18, 800.The largest fire was in 1889 (9,043 acres), which the Johnson Bar fire perimeter overlays. With the exception of the 1910-1919 reburns, generally the trend in the general area appears to be that the reburn potential begins around 20 years after the first fire. This time allows for enough smaller surface fuels and ladder fuels in the form of regeneration to accumulate to actively carry the next fire and become established in the heavier fuels that are amassing as snags fall.



Map 2: Project and surrounding area with reported fires (180) from 1970-2013, fire perimeter and origin.

The 1934 fire denoted in the upper right-hand corner of Map 3 is the Pete King fire. Two fires are referenced (Pete King and McClendon Butte) in the excerpts from eye-witness reports describing the situation.

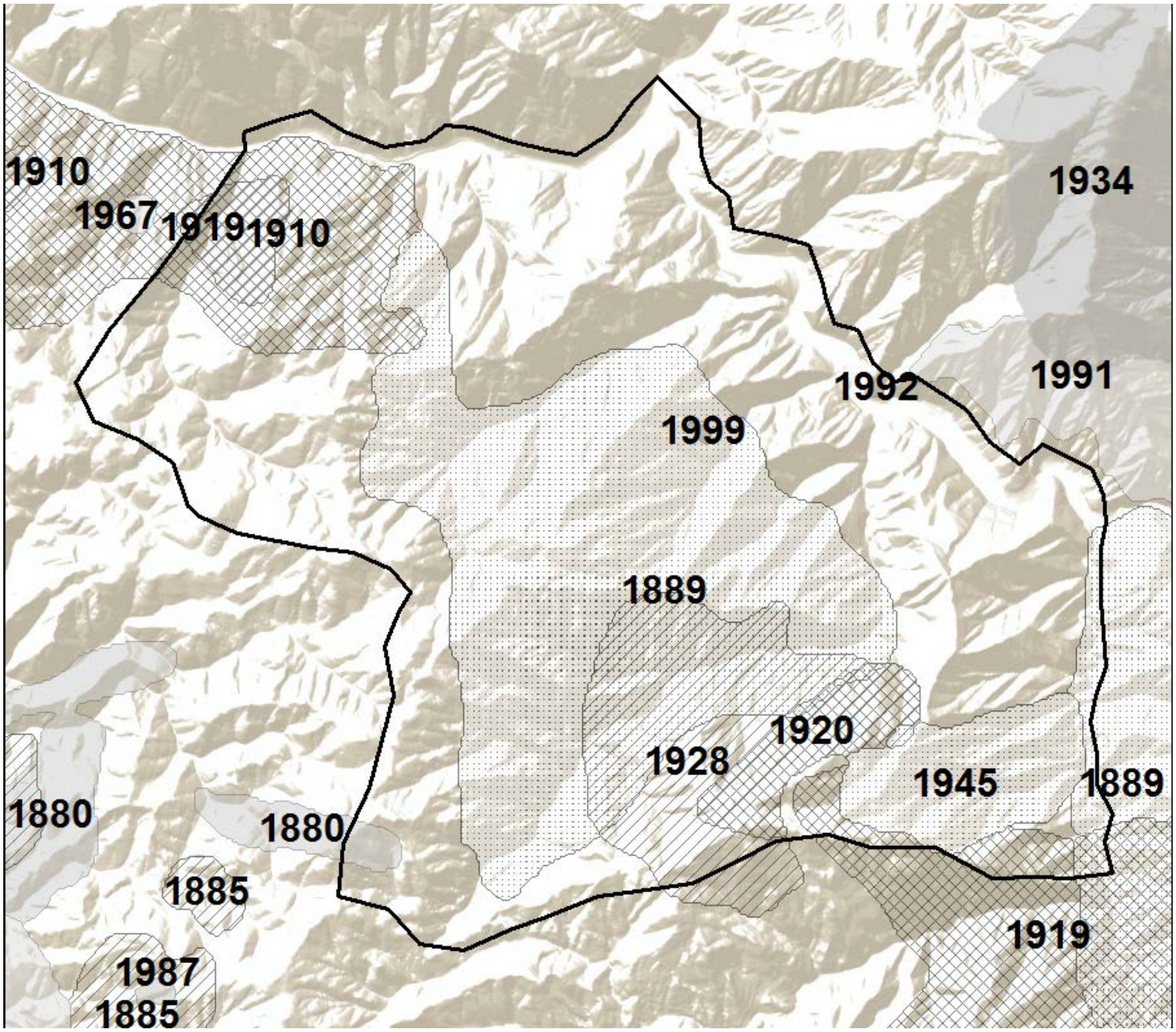
> *The Pete King and McLendon Butte fires both started in single burns of 1919 and 1917 respectively. The points of origin were in areas of cedar snags, down timber and brush. This fuel type covered a large area surrounding the points of origin and was considered one of the worst fire hazards in Region One*. (The Clearwater Story)
>
> *"FIRES INVOLVED: The records show that one man-caused fire of August 7 and 19 lightning-caused fires of August 11 were responsible for the 1934 conflagration.*

"Of the 20 fires concerned, two, the Pete King and McLendon Butte, were directly responsible for over 95 percent of all costs and damages sustained and area burned. They were both lightning fires of August 11. The remainders of the 20 fires were all handled without excessive costs, damages or area burned except two. The Pete King fire surrounded these before they were controlled.

"FUEL TYPES: The types of fuels which existed throughout the area were conspicuously above average both in rates of spread and resistance to control. This situation was the direct result of single burns of the years 1910, 1917, and 1919 and which constituted 75 percent of the area. The balance of the area was green timber—20 percent and multiple burn—5 percent.

"The three major factors which made this area one of the worst hazards of the Region were: (1) large, continuous areas of cedar and white fir snags and windfall intermixed with much fine fuel; (2) exceptionally long, steep slopes exposed to the ever prevalent, deceptive winds and drafts of the Lochsa and Selway River canyons; (3) the astonishing lack of reproduction or other green vegetation of sufficient growth to slow fire spread on ordinary burning days with a consequent over abundance of grass and other fine fuels which greatly increased it."

Both the Pete King and McLendon Butte fires started and continued throughout the first several days in fuels classified high rate of spread and high resistance to control. (Early Days in the Forest Service)



Map 3: Fire history since late 1880s. Only former Nez Perce N.F. data, does not in former Clearwater N.F. data to the north.

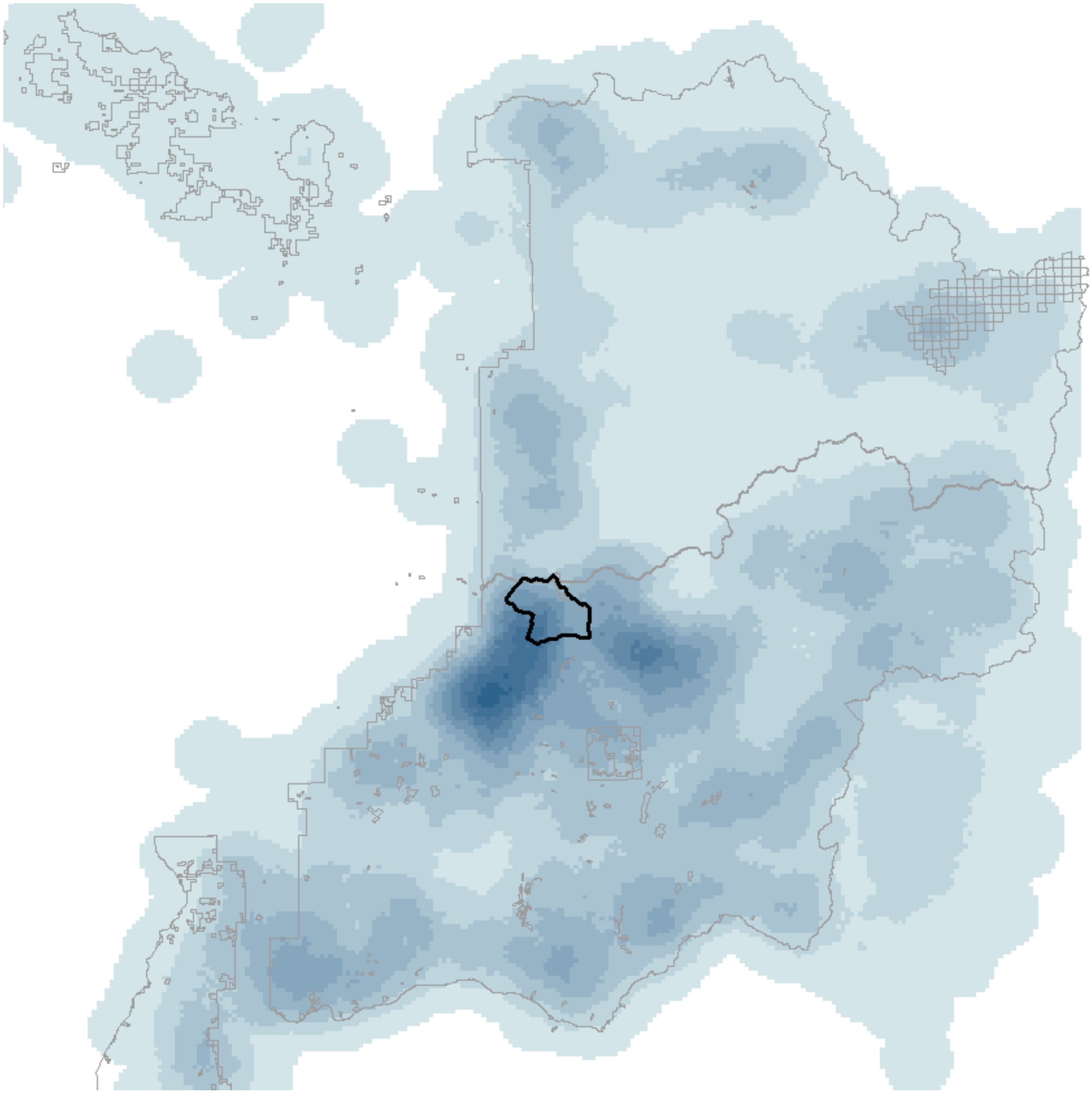
While the scope of the Pete King fire was much larger than the Johnson Bar fire, the effects of the Johnson Bar fire should be similar in high mortality areas.

Additionally, the climate of the area in the draws is moist and generally does not support large fire growth except in the more extreme fire weather years (low relative humidities and high air temperatures), of which 2014 was. (Smith, 1997). This concentrates suppression activities to times when they are least effective (Reinhardt *et al*., 2008) because the extreme fire behavior overwhelms suppression efforts.

On August 3, 2014 the Johnson Bar fire started in the Goddard Creek drainage and burned through October, accruing approximately 13,300 acres at a cost of approximately $13, 500, 000 (See Map 1).

Insect and disease mortality in the project area contributed highly to the extreme fire behavior exhibited by the Johnson Bar fire when it burned through these areas. Other factors hampering suppression efforts were lack of quick access and inability to quickly construct firelines due to high large diameter surface fuel loadings. Fire weakened trees continue to be susceptible to insect and disease mortality and die and fall in addition to the already dead trees.

Generally, lightning storms track across the area from southwest to northeast. Using a point density grid, which shows the relative amount of fire starts per area, it is apparent that the project lies at the northeast end of a distinct historical storm track, the highest density on the Nez Perce-Clearwater National Forest (See Map 4). It is reasonable to assume that this area will continue to have a high fire frequency. If a warming trend in global climate occurs, studies suggest that lightning activity may increase over the western United States, which could amplify ignitions in the local area (Summers, 2011)(Romps, 2014).



Map 4: Fire density of the Nez Perce-Clearwater National Forest with project area in center. Darker colors denote higher fire frequency.

2.3. Purpose and Need for Action

The purpose of the proposal would be to salvage timber before it loses its economic value, which would assist in supporting the economic structure of local communities and to provide for regional and national needs; reduce potential sediment inputs into the aquatic ecosystem from decommissioning approximately 20 miles of roads. Other benefits may include maintaining habitat structure, function, and diversity; improving overall watershed conditions; restoring early seral species on the landscape; and to provide improved forage for big game species. These actions are needed to move resource conditions in the proposed project area from existing conditions toward desired future conditions.

The following resource management opportunities were identified for the proposed project area based upon existing conditions; the applicable Forest Plan management direction; recommendations in the Selway and Middle Fork Clearwater Rivers Subbasin Assessment (USDA Forest Service 2001); and the needs, opportunities, and issues identified by an interdisciplinary team, field reviews, and public input.

2.3.1. Goods and Services

2.3.1.1. *Existing Condition:* The Johnson Bar Fire, started in August 2014, burned over 13,000 acres across the lower Selway and Middle Fork drainages resulting in widespread tree mortality. Much of the mortality occurred in Management Areas allocated for suitable for timber production.

2.3.1.2. *Desired Future Condition:* The Desired condition is to provide a sustained yield of resource outputs as directed by the Nez Perce Forest Plan.

2.3.1.3. *Need for Action:* Fire killed trees lose economic value quickly. There is a need to utilize the trees so harvested timber can provide materials for local industries.

2.3.2. Fisheries and Watershed Restoration

2.3.2.1. *Existing Condition:* Gravel and native surface roads could contribute sediment to stream channels through surface erosion, ditchline flow into streams, and through road failures. This can negatively affect water quality and fish habitat. Within and adjacent to the fire perimeter are roads that are no longer needed for future management. Most of these roads are either closed year-round to motorized use, or are non-system roads (leftover from past management and not considered part of the current transportation system). There are opportunities to decommission or store some of these roads in the project area. There are also opportunities to reduce road-related sediment from roads that are needed for future management.

2.3.2.2. *Desired Future Condition:* Maintain road systems that are stable, minimizing hydrologic connectivity to nearby streams and adverse effects to aquatic habitat.

2.3.2.3. *Need for Action:* There is a need to improve watershed function and reduce road-related sediment delivery to streams by removing unneeded roads, and storing or improving roads needed for future management.

2.4. Decision Framework

The Responsible Official for this proposal is the Forest Supervisor, Cheryl Probert. In making her decision, the Responsible Official will review the purpose and need, the Proposed Action and all Alternatives, the environmental consequences, and public comments to make the following decisions:

- Should salvage harvesting in the proposed project area be completed, and if so, which environmental and economic considerations should be applied?
- Should temporary roads be constructed, and if so, how many miles of roads should be constructed and where should they be constructed?
- Should any existing roads be decommissioned, and if so, how many miles and which ones?
- What design features, mitigation measures, and/or monitoring should be applied to the proposed project?

2.5. Public Involvement

A Notice of Intent (NOI) advertising the scoping period was originally published in the *Federal Register* on October 16, 2014. A corrected NOI was published in the *Federal Register* on October 24, 2014 updating the scoping period from the originally published 30 days to the corrected 45 days.

As part of the public involvement process, the USDA Forest Service (Agency) also listed the proposal in the quarterly Schedule of Proposed Actions (SOPA) beginning October 2014. The proposed project has been presented to the Nez Perce Tribe at quarterly staff-to-staff meetings since November 2014.

The Proposed Action was initially developed as a result of preliminary issues, concerns, and existing conditions that were identified by the interdisciplinary team (IDT). The IDT used issues raised by the public, other agencies, and the Nez Perce Tribe to develop the scope of the actions, alternatives, and effects to consider in the Draft EIS (DEIS). Many of the issues would be addressed through project design criteria and resource protection measures. Fifteen comment documents were received during the initial 45-day Scoping Period.

2.6. Issues

The Forest Service separated the issues into two groups: significant and non-significant. Significant issues were defined as those directly or indirectly caused by implementing the Proposed Action. Non-significant issues were identified as those outside the scope of the Proposed Action; already decided by law, regulation, Forest Plan, or other higher level decision; irrelevant to the decision being made; or conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Section 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Section 1506.3)…" A list of non-significant issues and reasons regarding their categorization as non-significant may be found in the project/administrative record.

2.6.1. Issues Used to Develop Alternatives to the Proposed Action

Several concerns raised by the IDT and by the public during scoping were used to develop Alternatives to the Proposed Action. Besides Alternative 1 – No Action and Alternative 2 – Proposed Action, two additional alternatives, Alternative 3 – Reduced Ground Disturbance and Alternative 4 – Economic Feasibility, were developed to address these concerns.

2.6.1.1. *Reduced Ground Disturbance*

Some commenters were concerned about potential sedimentation in the Selway and Middle Fork Rivers. As a result the IDT created Alternative 3 in order to minimize the amount of soil disturbance. Initially Alternative 3 considered no road decommissioning, limited temporary roads and landings, and limited ground based activities; however, road decommissioning was added to the alternative upward trend analysis outline in prescription watersheds in the Nez Perce National Forest Plan Appendix A, and the potential to reduce long-term sediment input into nearby streams. In the Selway portion of the proposed project area, this Alternative would utilize existing roads and landings along with eliminating ground-based yarding systems (i.e. tractor skidding). Some tractor ground in the Selway area would be skyline or helicopter logged. In the Middle Fork portion of the proposed project area, temporary roads would not exceed 500 feet in order to keep road development to a minimum.

Issue Indicators

- Sedimentation;
- Temperature;
- Altered hydrologic processes; and
- Large wood recruitment.

2.6.1.2. *Economic Feasibility*

Some commenters were concerned about the harvest feasibility of the logging systems because of the high percentage of helicopter logging. As a result the IDT developed Alternative 4 in order to minimize these effects. Alternative 4 dropped helicopter units at or over 5,000 feet yarding distance and units having high logging costs, such as the units with slash hauling along with those units requiring traffic control along Highway 12.

Issue Indicators

- Present net value; and
- Job supported.

2.6.1.3. *Harvesting and Activities Within and Seen from the Wild and Scenic River Corridor*

Some commenters were concerned about activities within the Wild and Scenic River corridor including harvest and helicopter landings and harvest that could been seen from the corridor including US Highway 12, Selway River Road and private residences. Alternative 4 partially addresses these concerns by reducing harvest within the Wild and Scenic River Corridor and dropping helicopter landings within the corridor. Design criteria assure visual quality objectives would be meet, including for those areas within and seen from the river corridor.

Issue Indicators

- Harvest within the Wild and Scenic River corridor;
- Helicopter landings within the Wild and Scenic River Corridor; and
- Visual Quality Objectives.

2.6.2. Concerns Raised in Response to Scoping

Concerns were raised during the scoping process by the public and the Nez Perce Tribe. The concerns included sedimentation in the Selway and Middle Fork Rivers, harvesting and visual concerns along the Wild and Scenic River, and traffic concerns along Highway 12.

2.7. Regulatory Requirements and Required Coordination

2.7.1. Forest Plan Direction

Although the Clearwater and Nez Perce National Forests were administratively combined in February 2013, management of the lands formerly within the boundary of the Nez Perce National Forest will continue to be guided by direction found in the Nez Perce National Forest Plan until the plan is revised. The Nez Perce National Forest Plan (USDA Forest Service 1987a, as amended) includes goals, objectives, standards, and guidelines that direct management of forest resources. Forest Plan direction is established at 2 scales: Forest-wide direction is applicable throughout the Forest, and management area direction ties specific goals, objectives, and standards to the unique capabilities of given parcels of land.

Nez Perce National Forest Plan standards apply to National Forest Service (NFS) lands within the Nez Perce National Forest boundary. They are intended to supplement, not replace, National and Regional policies, standards, and guidelines found in Forest Service Manuals (FSM) and Handbooks.

The proposed project analysis was guided by the goals, objectives, standards, guidelines, and management area direction within the Nez Perce National Forest Plan. This Project would help move the Forest toward desired conditions as described in the Forest Plan and other relevant planning directives.

2.7.2. Clean Air Act

The Clean Air Act, passed in 1963 and amended numerous times since then, is the primary legal authority governing air quality management. This Act provides the framework for national, state, and local efforts to protect air quality. The Montana/Idaho State Airshed Group was formed to coordinate all prescribed burning activities in order to minimize or prevent impacts from smoke emissions and ensure compliance with the National Ambient Air Quality Standards (NAAQS) issued by the Environmental Protection Agency (EPA), the federal agency charged with enforcing the Clean Air Act. The USDA Forest Service, including the Moose Creek Ranger District, is a member of this Airshed Group. The proposed project area is within the North Airshed Unit 13. All post-harvest site preparation and timber salvage would be conducted according to the requirements of the Montana/North Idaho Smoke Management Unit guidelines.

2.7.3. Clean Water Act

The Clean Water Act, as amended, stipulates that states are to adopt water quality standards. Included in these standards are provisions for identifying beneficial uses, establishing the status of beneficial uses, setting water quality criteria, and establishing Best Management Practices (BMPs) to control non-point sources of pollution. Executive Order 12088 also requires the Forest Service to meet the requirements of the Act.

Section 313 of the Clean Water Act, as amended, requires Federal agencies to comply with all Federal, State, interstate, and local requirements, administrative authority, and processes and sanctions with respect to control and abatement of water pollution.

Section 303(d) of the Clean Water Act, as amended, stipulates that states must identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). For waters identified on this list, states must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards.

Section 402 of the Clean Water Act, as amended, states that a National Pollutant Discharge Elimination System (NPDES) permit is required for point source discharges including stormwater runoff from logging roads that is collected by, and then discharged from, a system of ditches or culverts. The Forest Service is not currently bound by this decision (Consolidated Appropriations Act, 2012, § 429, Pub. L. No. 112-74, 125 Stat. 786, 1046-1047, Dec. 23, 2011); however, if required at the time of project implementation, the permits would be obtained.

Section 404 of the Clean Water Act, as amended, requires permits to dredge or fill within waters of the United States. The US Army Corps of Engineers administers these provisions.

2.7.4. State Water Quality Standards

Environmental Protection Agency regulations require each state to adopt an anti-degradation policy as one component of its water quality standards. The objective of the Idaho Anti-degradation Policy is, at a minimum, to maintain and protect existing instream water uses and the level of water quality necessary to protect those uses (IDAPA 16.012501,01). Beneficial uses and water quality criteria and standards are identified in the State of Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02).

2.7.5. Region 1 Soil Quality Standards

Region 1 FSM Soil Supplement 2500-99-1 updates and clarifies the previous soil quality supplement (FSH 2509.18-94-1, Chapter 2) based on recent research and collective experience. The analysis standards address basic elements for the soil resource: (1) soil productivity (including soil loss, porosity; and organic matter), and (2) soil hydrologic function. Region 1 Soil Quality Standards (USDA Forest Service 2014) specify that at least 85 percent of an activity area, which is defined as a land area affected by a management activity, must have soil that is in satisfactory condition. These Regional Soil Quality Standards require that detrimental management impacts (e.g., compaction, displacement, rutting, severe burning, surface erosion, and mass wasting) to the soil resource not exceed 15 percent of an activity area and that retention of coarse woody material be appropriate for the habitat type. In areas exceeding 15 percent detrimental soil conditions as a result of prior activities, the cumulative detrimental effects from project implementation, including restoration, should not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality. Project design criteria were developed to better meet these soil quality standards.

2.7.6. The National Fire Plan and Healthy Forest Restoration Act

The National Fire Plan (NFP) was developed in August 2000 following a landmark wildfire season with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capabilities. The NFP addresses 5 key points: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability. With regard to jurisdiction, direction in the NFP allows for the Forest Service to take NFP action on NFS lands, and for States to take and coordinate action on State and private lands. The Healthy Forests Restoration Act of 2003 (HFRA) (P.L. 108-148) contains a variety of provisions to address hazardous fuel reduction and forest restoration projects on specific types of federal lands that are at risk of wildland fire and/or insect and disease epidemics. The HFRA helps all landowners and managers restore healthy forest and rangeland conditions on those lands, regardless of ownership.

Both the NFP and HFRA provide overarching direction to reduce the threat of wildfire and restore ecosystems. Management actions proposed within the Project area are designed to be consistent with this direction. Particularly, proposed management activities would trend the general landscape condition toward desired fuel profiles and would optimize opportunities to treat hazardous fuels in identified Wildland-Urban Interface (WUI) lands and across the project area landscape.

2.7.7. Endangered Species Act

FSM 2670 directs the Forest Service to conserve endangered and threatened species and to utilize its authorities in furtherance of the Endangered Species Act (ESA), and to avoid actions that may cause a species to become threatened or endangered. FSM 2670 also requires the Forest Service to maintain viable populations of all native and desirable non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on NFS lands. As directed by the ESA, biological assessments and consultation under Section 7 of the ESA will be completed for this decision.

2.7.8. Executive Orders 11988 and 11990

These federal Executive Orders (EOs) provide for the protection and management of floodplains and wetlands. Numerous floodplains and wetlands exist within the analysis area.

EO 11988 (Floodplain Management) requires federal agencies to evaluate the potential effects of actions it may take in a floodplain to avoid adversely impacting floodplains wherever possible, to ensure that its planning programs and budget requests reflect consideration of flood hazards and floodplain management, including restoring and preserving such land areas as natural undeveloped floodplains, and to prescribe procedures to implement the policies and procedures of this EO.

EO 11990 (Protection of Wetlands) requires Federal agencies to take action to avoid adversely impacting wetlands wherever possible, to minimize wetlands destruction and preserve the values of wetlands, and to prescribe procedures to implement the policies and procedures of this EO. The Johnson Bar Fire Salvage project activities have been designed to be consistent with the requirements of EO 11988 and EO 11990 through the retention of PACFISH buffers.

2.7.9. Executive Order 12898

EO 12898 (Environmental Justice) directs each federal agency to make environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. An associated memorandum emphasizes the need to consider these types of effects during NEPA analysis. The Proposed Action and alternatives would not disproportionately adversely affect minority or low-income populations, including American Indian tribal members.

2.7.10. Executive Order 13112

EO 13112 (Invasive Species) was issued on February 3, 1999, to enhance federal coordination and response to the complex and accelerating problem of invasive species. EO 13112 directs federal agencies to work together [as stated in the Preamble] to "…prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.” Project activities have been designed to be consistent with the requirements of EO 13112.

2.7.11. Idaho Forest Practices Act

The Idaho Forest Practices Act regulates forest practices on all land ownership in Idaho. Forest practices on National Forest Service lands must adhere to the rules pertaining to water quality (IDAPA 20.02.01). The rules are also incorporated as BMPs in the Idaho Water Quality Standards. Project activities have been designed to be consistent with the Idaho Forest Practices Act.

2.7.12. Idaho State Water Quality Standards

Environmental Protection Agency regulations require each state to adopt an anti-degradation policy as one component of its water quality standards. The objective of the Idaho Anti-degradation Policy is, at a minimum, to maintain and protect existing instream water uses and the level of water quality necessary to protect those uses (IDAPA 16.012501,01). Beneficial uses and water quality criteria and standards are identified in the State of Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02, IDAPA 37.03.02).

2.7.13. Idaho Stream Channel Protection Act

The Idaho Stream Channel Protection Act regulates stream channel alterations between mean and high water marks on perennial streams in Idaho (IDAPA 37.03.07). Instream activities on NFS lands must adhere to the rules pertaining to the Act. The rules are also incorporated as BMPs in the Idaho Water Quality Standards. Project activities have been designed to be consistent with the Idaho Stream Channel Protection Act.

2.7.14. National Environmental Policy Act, Sections 101 and 106

The National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) was signed into law on January 1, 1970. NEPA establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals within the federal agencies. NEPA also established the CEQ.

Title I of NEPA contains a Declaration of National Environmental Policy that requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony. Section 102 requires federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach. Specifically, all federal agencies are to prepare detailed statements assessing the environmental impact of and alternatives to major federal actions significantly affecting the environment. These statements are commonly referred to as Environmental Impact Statements (EISs).

The public has an important role in the NEPA process, particularly during scoping, to provide input on what issues should be addressed in an EIS and to comment on the findings in an agency's NEPA documents. The public can participate in the NEPA process by attending

NEPA-related hearings or public meetings and by submitting comments directly to the lead agency. The lead agency must consider all comments received from the public and other parties on NEPA documents during the comment period.

2.7.15. National Forest Management Act

The National Forest Management Act (NFMA) (16 U.S.C. 1600–1614, August 1974, as amended 1976, 1978, 1980, 1981, 1983, 1985, and 1990) reorganized, expanded, and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on NFS lands. The NFMA requires the Secretary of Agriculture to assess forest lands; develop a management program based on multiple-use, sustained-yield principles; and implement a resource management plan for each unit of the NFS. It is the primary statute governing the administration of national forests. Project activities have been designed to be consistent with the NFMA.

2.7.16. National Historic Preservation Act

Section 101 of the National Environmental Policy Act requires federal agencies to preserve important historic, cultural, and natural aspects of our national heritage. The legal processes associated with the protection and preservation of these resources is outlined in the National Historic Preservation Act of 1966 (NHPA) (36 CFR 800) and subsequent amendments. Passed by Congress two years before NEPA, the NHPA sets forth a framework for determining if a project is an "undertaking" that has the potential to effect cultural resources. The implementing regulations also outline the processes for identifying, evaluating, assessing effects, and protecting such properties. The coordination or linkage between the Section 106 process of the NHPA and the mandate to preserve our national heritage under NEPA is well understood and is formally established in 36 CFR 800.3b and 800.8. The terminology of "…important historic, cultural, and natural aspects of our national heritage" found in NEPA includes those resources defined as "historic properties" under the NHPA [36 CFR 800.16(l)(1)]. It is thus the Section 106 process that agencies utilize to consider, manage, and protect historic properties during the planning and implementing stages of federal projects. The Forest meets its responsibilities under NHPA through compliance with the terms of a Programmatic Agreement (PA) signed between Region 1, the Idaho State Historic Preservation Office, and the Advisory Council on Historic Preservation.

2.7.17. National Wild and Scenic Rivers Act

Section 10(a) of the Wild and Scenic Rivers Act states:

Each component of the national Wild and Scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other such uses that do not interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting ***aesthetic, scenic, historic, archaeologic, and scientific features****.*

> *Management Plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.*

2.7.18. Tribal Treaty Rights

American Indian tribes are afforded special rights under various federal statutes: NHPA; NFMA; Archaeological Resources Protection Act of 1979 (ARPA) (43 CFR Part 7); Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (43 CFR Part 10); Religious Freedom Restoration Act of 1993 (P.L. 103141); and the American Indian Religious Freedom Act of 1978 (AIRFA). Federal guidelines direct federal agencies to consult with tribal representatives who may have concerns about federal actions that may affect religious practices, other traditional cultural uses, or cultural resource sites and remains associated with tribal ancestors. Any tribe whose aboriginal territory occurs within a project area is afforded the opportunity to voice concerns for issues governed by NHPA, NAGPRA, or AIRFA.

Federal responsibilities to consult with tribes are included in the NFMA; Interior Secretarial Order 3175 of 1993; and EOs 12875, 13007, 12866, and 13084. EO 12875 (Enhancing the Intergovernmental Partnership) calls for regular consultation with tribal governments. EO 13007 (Indian Sacred Sites) requires consultation with tribes and religious representatives on the access, use, and protection of sacred sites. EO 12866 (Regulatory Planning and Review) requires that federal agencies seek views of tribal officials before imposing regulatory requirements that might affect them. EO 13084 (Consultation and Coordination with Indian Tribal Governments) provides direction regarding consultation and coordination with tribes relative to fee waivers. EO 12898 (Environmental Justice) directs federal agencies to focus on the human health and environmental conditions in minority and low-income communities, especially in instances where decisions may adversely impact these populations (see “Executive Order 12898” above). NEPA regulations (40 CFR 1500–1508) invite tribes to participate in forest management projects and activities that may affect them.

Portions of the Forest are located within ceded lands of the Nez Perce Tribe. Ceded lands are federal lands on which the federal government recognizes that a tribe has certain inherent rights conferred by treaty. In Article 3 of the Nez Perce Treaty of 1855, the United States of America and the Nez Perce Tribe mutually agreed that the Nez Perce retain the following rights:

> …taking fish at all usual and accustomed places in common with citizens of the Territory [of Idaho]; and of creating temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing horses and cattle…

The proposed Johnson Bar Fire Salvage project has been presented to the Nez Perce Tribe at the quarterly staff-to-staff meetings since November 2014.

2.8. Scope of the Analysis

The Code of Federal Regulations (40 CFR 1508.25) requires the Forest Service to consider three types of actions (connected, similar, and cumulative) to determine the scope of the analysis.

Connected Actions are those actions that are closely related and are part of a larger action. One action would not occur without the other components. Overall, the Proposed Action and the Alternatives are not an interdependent part of a larger action.

Similar Actions are those actions which, when viewed with other reasonably foreseeable proposed actions, have similarities that provide a basis for evaluating their environmental consequences together, but are not necessarily connected. The salvage harvest and road decommissioning for the Johnson Bar proposal are considered similar actions, due to each having similar time frames, geographic areas, and purposes.

Cumulative Actions are those actions, which when viewed in conjunction with other past, present, and reasonably foreseeable future actions would result in impacts having cumulative effects; and therefore, should be discussed in the same analysis. A table listing all known past, present, and reasonably foreseeable future actions overlapping the temporal and spatial bounds of the proposal is located in Chapter 4.

2.9. Availability of Project Files

An important consideration in preparation of this EIS has been the reduction of paperwork as specified in 40 CFR 1500.4. In general, the objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental effects as a result of implementing any of the proposed alternatives and how these effects would be mitigated. More detailed information is located in the project file and is available for public inspection.

2.10. Organization of the Draft EIS

This EIS includes information necessary for the Forest Supervisor to make a decision based on the environmental effects of the Proposed Action or the Alternatives. Federal regulations specify the types of information necessary for decision-makers to make good decisions. In so doing, this document is organized as follows:

- Chapter One states the purpose and need for the action. The purpose and need is the basis upon which to evaluate any alternatives to the Proposed Action.
- Chapter Two describes the four alternatives in detail, including the No Action alternative, and summarizes the differences between the alternatives, particularly in regards to potential environmental effects.
- Chapter Three describes the baseline (existing) conditions for each resource area that may be affected by the Proposed Action or Alternatives.
- Chapter Four analyzes the potential environmental effects (direct, indirect, and cumulative) as a result of implementing the proposed alternatives.

- Chapter Five lists those involved in the preparation and review of the Draft EIS, including the IDT and other technical support. It also includes a distribution list for the Draft EIS.
- Other sections include references cited, a glossary, an index, acronyms, and appendices containing supporting technical information.

CHAPTER 2

ALTERNATIVES INCLUDING THE PROPOSED ACTION

2. Introduction

This chapter describes and compares the alternatives considered for the proposed Johnson Bar Fire Salvage project and includes a discussion of each alternative analyzed in detail, a listing of the alternatives eliminated from detailed analysis, and a comparison of the alternatives as to how they address the proposed project purpose and issues. This comparison will address differences between the alternatives and provide a clear basis for decision making by the Responsible Official. Maps for each of the alternatives analyzed in detail are included in Appendix G.

The proposed Johnson Bar project was developed as a means in which to capture economic value, where appropriate, in order to offset treatment costs of restoration projects in the fire affected area. The Interdisciplinary Team (IDT) used a restoration based framework to evaluate areas that were suitable for harvesting; first identifying areas of 50% or greater mortality that could be economically accessed, and then removed areas with a high potential for mass wasting (landslides, unstable slopes, etc.) or that could contribute to additional unwanted effects if harvested. Design measures were developed to address social concerns, such as aesthetics and recreation, as well as to further minimize or avoid adverse impacts to Threatened, Endangered or Sensitive (TES) species.

2.1. Alternatives Considered in Detail

The Forest Service developed four alternatives in response to public scoping and issues raised as a result of IDT input. These alternatives consist of the No Action Alternative (Alternative 1), Proposed Action (Alternative 2), Reduced Ground Disturbance (Alternative 3), and Economic Feasibility (Alternative 4). All alternatives were given equal weight, and any remaining issues considered were used to in order to modify the action alternatives.

2.2. Actions Common to all Action Alternatives

The following actions would be included as a component of all of the action alternatives.

- Harvest activities would include 57.8 miles of maintenance and reconditioning of haul roads, to include removal of brush, clearing of culvert inlets, grading of the roads for water flow control, and the removal of closure barriers as needed;
- 20.2 miles of non-system road decommissioning;
- 1.1 miles of system road decommissioning;
- 4.8 miles of road storage system roads;
- The Design Criteria.

2.3. Alternative 1 – No Action

Under the "No Action" alternative, neither the Proposed Action nor the other alternatives would be implemented and current management actions would continue to guide management of the proposed project area. Along with this alternative providing a baseline for comparison of the environmental consequences as a result of potential implementation of the other alternatives (36 CFR 1502.14), the No Action alternative is potentially an appropriate management option that could be selected by the Responsible Official.

2.4. Alternative 2 – Proposed Action

The Forest Service is proposing to harvest 2,973 acres within the Johnson Bar Project Area, of which 202 acres would utilize tractor logging, 1,310 acres would utilize skyline logging, and 1,461 acres would be through helicopter logging. Activities would also include 10.6 miles of system haul road reconstruction, to include culvert replacement, spot surfacing, stabilization of Road #470, installation of cross-drainage on Road #9723B, installation of culverts on Road #653A, and opening of decommissioned Road #470B. Any additional haul roads being utilized as part of the proposed project would consist of County and State highways. The Proposed Action would utilize 4 miles of new and existing temporary roads and 19 new and existing helicopter landings.

2.5. Alternative 3 – Reduced Ground Disturbance

In response to comments received during the Scoping process regarding potential sedimentation in the Selway and Middle Fork Rivers, the Forest Service developed Alternative 3. In Alternative 3, the Forest Service is proposing to harvest 2,580 acres within the Johnson Bar Project Area, of which 8 acres would utilize tractor logging, 1,043 acres would utilize skyline logging, and 1,529 acres would be through helicopter logging. Activities would also include 9.8 miles of system haul road reconstruction, to include culvert replacement, spot surfacing, stabilization of Road #470, installation of cross-drainage on Road #9723B, and installation of culverts on Road #653A. Any additional haul roads being utilized as part of the proposed project would consist of County and State highways. Alternative 3 would utilize 0.7 mile of new and existing temporary roads, and 13 new and existing helicopter landings, in order to reduce the amount of disturbances along the Selway River.

2.6. Alternative 4 – Economic Feasibility

In response to internal and external comments received during the Scoping process regarding economic feasibility, harvesting within or seen from the Wild and Scenic River Corridor and landings along Highway 12 and the Selway River Road, the Forest Service developed Alternative 4. Under this Alternative, the Forest Service is proposing to harvest 2,298 acres within the Johnson Bar Project Area, of which 202 acres would utilize tractor logging, 1,310 acres would utilize skyline logging, and 786 acres would be through helicopter logging. Activities would also include 10.6 miles of system haul road reconstruction, to include culvert replacement, spot surfacing, stabilization of Road #470, installation of cross-drainage on Road #9723B, installation of culverts on Road #653A, and opening of decommissioned Road #470B. Any additional haul roads being utilized as part of the proposed project would consist of County and State highways. Alternative 4 would utilize 4.6 miles of new and existing temporary roads, in order to reduce logging costs, and 11 new and existing helicopter landings.

2.7. Comparison of the Alternatives

Table 2.1 provides a summary comparison of the potential activities of implementing each of the proposed alternatives.

Table 2.1: Comparison of Proposed Activities by Alternative

Activity	Alternative1 No Action	Alternative2 Proposed Action	Alternative 3 Reduced Ground Disturbance	Alternative 4 Economic Feasibility
Fire salvage harvest (Acres)	0	2,973	2,580	2,298
Haul roads; Road maintenance/ reconditioning (miles)	0	57.8	57.8	57.8
Haul roads; System road reconstruction (miles)	0	10.6	9.8	10.6
Total haul roads used on USFS administered lands (miles)	0	68.4	67.6	68.4
Temporary roads – existing template (miles)	0	0.9	0.5	0.9
Temporary Roads – New Construction (miles)	0	3.1	0.2	3.7
Tractor swing trails (miles)	0	1.1	0.2	1.1

Activity	Alternative1 No Action	Alternative2 Proposed Action	Alternative 3 Reduced Ground Disturbance	Alternative 4 Economic Feasibility
Logging system (acres)	0	Tractor - 202 (7%) Skyline -1,310 (44%) Helicopter – 1,461 (49%)	Tractor – 8 (1%) Skyline – 1,043 (40%) Helicopter – 1,529 (59%)	Tractor - 202 (9%) Skyline – 1,310 (57%) Helicopter - 786 (34%)
Helicopter landing EXISTING	0	10	10	7
Helicopter landing NEW	0	9	3	9
Site preparation and reforestation (acres)	0	2,973	2,580	2,298
Road decommissioning non-system roads (miles)	0	20.2	20.2	20.2
Road decommissioning system roads (miles)	0	1.1	1.1	1.1
Road storage system roads (miles)	0	4.8	4.8	4.8

2.8. Alternatives Considered but Eliminated from Detailed Analysis

In accordance with NEPA, Federal Agencies are required to rigorously explore and objectively evaluate any reasonable alternatives and to briefly discuss the reasoning should any alternative be eliminated for detailed analysis (40CFR 1502.14). Public comments received during the Scoping process provided alternative suggestions in order to achieve the purpose and need of the proposed project. Each alternative was reviewed to determine if it: (1) met the purpose and need; (2) addressed the issues; (3) whether or not the alternative was feasible; and (4) whether or not the alternative was consistent with the Forest Plan, laws, and regulations. The following alternatives were eliminated from detailed analysis:

- **More harvesting:** Some commenters expressed concerns that the scope of the project was too small; that the proposal does not capture enough economic value of burned trees or treat enough acreage to have measurable ecologic outcomes. The IDT considered additional opportunities but eliminated them from detailed analysis because it would entail harvesting in landslide prone or other ecologically sensitive areas; areas of high burn severity or other areas not readily accessible which would generate little or no economic return.

- **No harvesting along the Wild and Scenic River corridor:** Commenters suggested that harvest within the Wild and Scenic River corridor (WSR) was inconsistent with management direction and an alternative that avoids harvest in the WSR should be considered. The IDT considered this proposed alternative; however, Forest Plan direction allows for limited harvest within the Wild and Scenic River corridor; therefore, it was eliminated from detailed analysis.
- **No harvesting in visual areas:** Commenters expressed concerns over the visual impacts of the proposed harvest and "clear cuts" in particular. The IDT considered alternatives that would avoid harvest visible from US Highway 12, the Selway River Road, and other sensitive viewpoints but did not analyze them in detail because they did not meet the purpose and need; and were therefore eliminated from detailed analysis. Harvest areas are designed to meet the Forest Plan visual quality objectives for visually sensitive areas through variable tree retention and Design Criteria, which are analyzed in Chapters 3 and 4.
- **No harvest in unroaded areas:** Some commenters requested an alternative be analyzed that avoided harvest in the former Middle Fork Face roadless area, as designated by the 1987 Nez Perce Forest Plan. Commenters felt that unroaded areas in the Middle Fork might meet the minimum criteria for Wilderness consideration and that harvest would constitute an irretrievable commitment of resources that must be analyzed. The IDT considered this alternative, but did not analyze it in detail because the Idaho Roadless Rule removed the Middle Fork Face as a recognized roadless area under the 2008 Idaho Roadless Rule. The remaining unroaded area within the Middle Fork does not meet the minimum size criteria for Wilderness and previous harvest would make unimpaired preservation of the area impractical.

2.9. Design Criteria

The following design criteria would be included as components common to all action alternatives.

2.9.1. Soils

1. Effectiveness of design features are moderate to high based on past monitoring and research (Froehlich and McNabb 1983; Graham *et al*. 1994; Graham *et al*. 1999; Korb 2004; Neary *et al*. 2008; Curran *et al*. 2005a,b). Skid trails, landings, and yarding corridors would be located and designated to minimize the area of increased detrimental soil effects.

2. Landslide prone areas have been mapped and field verified in the harvest units. These landslide prone areas would be further delineated in the field, would be excluded during unit layout, and would receive a PACFISH buffer (Nez Perce LRMP as amended by PACFISH 1995). Indicators of landslide prone areas include: steep (over 60%) concave slopes; hydrophytic vegetation (i.e. sedges, moist site ferns); slumps, draws, and basins; past landslide locations; and obvious soil movement areas

(typically indicated by curved and/or buttressed tree boles, soil creep, tension cracks, etc.). No harvest activities would occur in these areas.

3. In all units, to reduce ground disturbance, no ground based skidding would be allowed on slopes over 35 percent.
4. For all harvest units, coarse woody material appropriate to the site would be retained for maintaining soil moisture, soil stability, and other soil physical and biological properties after all unit activities. Regional guidance for organic matter recommends the following guidelines, such as retaining coarse woody material (> 3 inches diameter) to maintain soil productivity (Graham et al. 1994). Moister habitat types require 17–33 tons/acre. Approximately 14–28 standing trees would be retained for future down wood recruitment. Retention levels on the higher end of the range would be used for proposed regeneration harvest units 107, 117, 142, and 148, because of low existing woody material. Non-merchantable snags or other designated retention trees felled for safety reasons would be left in the unit.
5. Landings, skid trails, and slash piles would be located in suitable sites to avoid, minimize or mitigate potential for erosion and sediment delivery to nearby waterbodies. Skid trails would not be placed within an RHCA or landslide prone areas. Only existing landings would occur within RHCAs.
6. Erosion control and sediment plans would cover all disturbed areas, including skid trails and roads, landings, cable corridors, temporary road fill, water source sites, borrow sites or other areas disturbed during harvest operations.
7. Use suitable species and establishment techniques to cover or vegetate disturbed areas in compliance with local direction and requirements for vegetation ecology and prevention and control of invasive species. Prevention and control of invasive plants within the project area would be consistent with the Nez Perce National Forest's Invasive Plants Treatment Project Record of Decision (1988).
8. Install sediment and stormwater controls prior to initiating surface disturbing activities to the extent practical.
9. Operate equipment when soil compaction, displacement, erosion and sediment runoff would be minimized (dry or frozen ground). Avoid ground equipment operations on highly erosive, unstable, wet or easily compacted soils and steep slopes as described per Nez Perce Forest Plan (USDA, 1987).
10. Road blading would only be done when necessary. Ditches would not be routinely bladed, and exposed soil areas on road prisms, ditches, cuts, and fills would be seeded as necessary to control erosion.
11. In areas of high and moderate wildfire burn severity or where the litter and duff layers have been removed by fire, slash would be left on site to provide for erosion and soil productivity protection. A ground cover of 85% should be maintained on site with both fine (maximum of 5-10 tons/acre) and coarse woody debris.
12. Winter Logging

a. Conduct winter logging operations when the ground is frozen or snow covered and depth is adequate to avoid rutting or displacement of soil.

b. Avoid locating skid trails on steep areas where frozen skid trails may be subject to soil erosion the next spring.

13. Cable and Aerial Yarding Operations
The majority of the units would use cable/aerial yarding operations to avoid soil disturbance and erosion risks. Given this method, soil disturbance and erosion risks from these systems are primarily confined to cable corridors and landings.

    a. Any exposed soil resulting from skyline logging corridors would be stabilized by placing slash over the area to achieve at least 95% coverage and by installing waterbars if trenching occurs.

    b. Locate cable corridors to efficiently yard materials with the least soil damage

    c. Use suitable measures to minimize soil disturbance when yarding over breaks in slope (i.e. intermediate supports).

    d. Yarding operations would be postponed when soil moisture levels are high if the specific type of yarding system results in unacceptable soil disturbance and erosion within cable corridors.

14. Ground-Based Skidding and Yarding Operations

    For units with potential ground based operations, the following design measures would be implemented in order to minimize soil erosion and soil productivity effects:

    a. Use of designated skid trails and harvest systems as approved by the soils specialist, such as re-use of existing disturbance, operating on a slash mat, and shovel logging systems.

    b. Activities would be restricted when soils are wet to prevent resource damage (indicators include excessive rutting, soil displacement, and erosion). Use of heavy equipment would be suspended when soil is too wet to support heavy equipment without detrimental resource damage.

    c. Directionally fell trees to facilitate efficient removal along pre-designated yarding patterns with the least number of passes and least amount of disturbed area.

    d. For all harvest units, decompaction would be required on skid trails where excavation or ground disturbance has occurred or where successive passes have taken place over the same trail. Decompaction would be conducted to improve soil productivity and meet Regional soil quality standards. Decompaction would span the width of the compacted areas and extend to a depth of 10–18 inches, to effectively loosen the ground to allow water penetration and revegetation and to prevent the rocky sub-surface soils from mixing with the topsoil. The depth of decompaction should be adjusted to avoid turning up large rocks, roots, or stumps. Equipment would not be permitted to operate outside the clearing limits of the skid trail. No decompaction work should be done during wet weather or when the ground is frozen or otherwise unsuitable.

2.9.2. Wildlife

1. All temporary roads would be closed to the public and decommissioned following use.
2. No old growth would be harvested.
3. Maintain a minimum 40-acre yearlong no-treatment buffer around occupied goshawk nest trees. No ground disturbing activities would be allowed inside occupied post-fledgling goshawk areas (minimum distance of 440 acres around the nest stand) from April 15 to August 15.
4. If an active bald eagle nest is detected in or near the Johnson Bar Salvage Project Area, all activities within ½ mile and up to 2 ½ miles from the nest would be postponed during the period of February 1 to August 15. No harvest would occur within ½ mile of an active bald eagle nest. This would allow for the nesting and rearing period of the recent eagle clutch to occur without external disturbances or displacement from project activities.
5. Large snags [≥ 15 inches diameter at breast height (DBH)] should be retained for all units if possible. The modified Northern Regional Snag Guidelines suggest leaving at least 4 snags (15-20 inches DBH) and 1.6 snags (≥20 inches DBH) average per acre (Bollenbacher, *et al.* 2009). It would be more favorable for wildlife if the retained snags occurred in clusters. In units that are lacking the sufficient quantity of snags, keep all possible snags and live trees with large DBH for recruitment snags.
6. If a den, nest sites, or other important habitat feature of any threatened, endangered, or sensitive species were to be discovered within or in close proximity to any treatment unit, project activities would be coordinated with a wildlife biologist so that appropriate conservation measures could be developed.

2.9.3. Aquatics

1. No timber harvest would occur within 300 feet of fish-bearing streams, 150 feet of perennial non-fish bearing water, 100 feet of intermittent streams, 100 feet from landslide prone areas, and a 150-foot slope distance from the edge of wetlands larger than one acre.
2. Contractors would have spill prevention and containment materials on site with stationary equipment and at fueling and maintenance sites to minimize the risk of an accidental spill of petroleum products, as well as to protect water courses and aquatic biota from adverse effects in the event of a spill.

3. Equipment staging, parking, servicing, and refueling would be outside of Riparian Habitat Conservation Areas (RHCAs) and in designated areas that have previous soil disturbance.
4. During road decommissioning or culvert replacements, measures to prevent damaging levels of sediment from entering streams would be undertaken, such as: (a) placing removable sediment traps below work areas to trap fines; (b) when working instream, removing all fill around pipes prior to bypass and pipe removal (where this is not possible, use non-eroding diversion); (c) revegetating scarified and disturbed soils with weed-free grasses for short-term erosion protection and with shrubs and trees for long-term soil stability; (d) utilizing erosion control mats on stream channel slopes and slides; (e) mulching with native materials, where available, or using weed-free straw to ensure coverage of exposed soils; (f) dissipating energy in the newly constructed stream channels using log or rock weirs; and (g) armoring channel banks and dissipating energy with large rock whenever possible.
5. Dust abatement would be used on major haul routes to minimize sediment input to streams from log hauling activities. The source location, quantity, and timing of dust abatement would be approved by the Forest Service before sale, in order to protect water resources during low flows. Water pumps intakes must be screened.
6. Conduct an IDT review during sale layout and contract preparation to ensure that the BMPs and additional project design criteria are incorporated into the layout and timber sale contract.
7. Riparian Habitat Conservation Areas
    a. Roadside hazard trees within streamside Riparian Habitat Conservation Areas (RHCAs) felled for safety purposes would be left onsite. Roadside hazard trees on landslide prone RHCAs felled for safety purposes would be left onsite, unless it is determined that they would create a hazardous fuels situation, in which case the tree(s) may be removed following coordination with the soils and watershed specialist to insure they can be removed without causing unacceptable soil impacts or creating erosion concerns. Non-roadside hazard trees within all RHCAs felled for safety reasons would be left onsite.
    b. There would be no new road construction adjacent or within RHCAs. There would be approximately 3.5 miles of temporary road construction on existing road templates or ridge tops. There would be no connectivity to the stream network, which would avoid concentrated flows and sediment transport to nearby waterbodies.
8. Ground-Based Skidding and Yarding Operations

    For units with potential ground based operations, priority would be given (in order) to following design measures to minimize soil erosion and soil productivity effects:

a. Design and locate skid trails and skidding operations to minimize soil disturbance to the extent practicable.

b. Locate skid trails to avoid concentrating runoff and provide breaks in grade.

c. No equipment would operate in areas where the average slope is greater than 35 percent, unless mitigating measures, such as operating on adequate compacted snow or only over short distances, are approved by the soil specialist.

d. No equipment operations would occur in burned ephemeral draws.

e. Use suitable measures to stabilize and restore skid trails when needed. This may include seeding, protection of plants, earthwork, and cultivation practices. Reshape the surface to promote dispersed drainage and install suitable drainage features. Stabilization work would be done after the harvest contract is implemented.

9. Cable and Aerial Yarding Operations (FSH 2409.15)

The majority of the units would be cable/aerial yarding operations to avoid soil disturbance and erosion risks. Given this method, soil disturbance and erosion risks from these systems are primarily confined to cable corridors and landings.

a. Slash (at least 95 percent ground cover) would be placed along skyline corridors to prevent rutting and erosion. If bare soil is exposed and ruts develop, waterbars would be installed at a maximum 100-foot interval.

b. There would be no yarding through RHCAs.

10. Landing

Landing locations are selected for least amount of excavation and erosion potential, where sidecast would neither enter drainages nor damage other sensitive areas.

a. Locate landings outside of the RHCAs and avoid locating landings on steep slopes or highly erodible soil.

b. Design roads and trail approaches to avoid overland flow entering the landing.

c. Existing landings would be used where possible.

d. Newly constructed landings would be obliterated after use.

11. Winter Logging

a. Install and maintain suitable erosion control on skid trails prior to spring runoff.

12. Haul Routes

a. Haul routes would be maintained to BMP standards, including proper drainage, adequate stream culvert capacity, cleared and functional cross-drains.

b. Sediment delivery points identified in the hydrology report would be addressed per the report recommendations.

c. Ensure that road drainage would be directed to areas of undisturbed forest floor, and not directly into a waterbody.

d. Avoid hauling and other heavy equipment traffic during road conditions when the road surface rutting would occur.

e. Sediment filtering devices (e.g., wattles, weed-free straw bales, filter fences, etc.) would be used as needed to limit erosion and delivery of sediment from roads into streams and ephemeral drainages.

f. Snowplowing:

    - Leave a minimum of approximately 2 inches of snow on road surfaces;
    - Do not side-cast snow into any stream channel;
    - Leave drainage points (breaches) in snow berms to avoid concentrated snow melt runoff onto road surfaces;
    - Do not operate vehicles or equipment on snow-covered roads during warm/soft conditions to avoid setting ruts.

13. Temporary Roads

a. Temporary roads would be constructed on or near ridge tops with no stream crossings. All temporary roads would be constructed and then obliterated within 2 operating seasons. Obliteration includes de-compaction, re-contouring where needed and the application of woody material onto the de-compacted surface to provide for soil productivity and limit erosion potential. There would be no road construction in RHCAs and roads would be located to avoid adverse effects to soil, water quality and riparian resources.

b. Maintain the natural drainage pattern of the area wherever practical; apply soil protective cover on disturbed areas.

c. Temporary roads would be inspected to verify that erosion and stormwater controls are implemented and functioning and are appropriately maintained.

d. All temporary roads would be scarified and decommissioned (all new construction would be recontoured; existing prisms would be placed in a stable condition through recontouring and/or decompaction). Cut/fill slopes and crossings would be reshaped to natural contours. Available slash and coarse wood material (>3 inches) would be applied to the recontour surface (slash is considered “available” where the equipment can reach it from the working area where the decommissioning is occurring). Temporary road rehabilitation work shall begin as soon as possible after the timber harvest operations have been completed. They are not intended to be left open for post –harvest treatment activities, such as site preparation, burning or planting.

e. If temporary roads are to be left open over winter, they should be winterized using appropriate soil stabilization methods, including additional erosion control measures that may include seeding, mulching, slash coverage, filter windrows, outsloping, or extra waterbarring.

14. Road Storage

a. There would be measures to close and/or physically block the road entrance so that unauthorized motorized vehicles cannot access the road.

b. Effective ground cover on disturbed sites to avoid or minimize accelerated erosion if needed.

15. Road Decommissioning

a. Implement suitable measures to re-establish stable slope contours, and surface and subsurface hydrologic pathways where necessary to the extent practicable to avoid or minimize adverse effects to soil, water quality and riparian resources.

b. Implement measures to promote infiltration of runoff and intercepted flow and/or desired vegetation growth on the road prism and other compacted areas.

16. Use of Prescribed Fire

a. Locate slash piles in areas previously disturbed so they do not interfere with natural drainage patterns and limit the damage to residual trees.

b. Jackpot burning for site preparation should only be considered under the following circumstances:

- Areas of low wildfire burn severity with intact litter and duff layers;
- Areas of low soil erosion hazard rating;
- Slopes less than 55%;
- There would be no proposed ignition within RHCAs. Low intensity fire may back into stream or landslide prone RHCAs if the RHCA integrity can be maintained.

2.9.4. Heritage Resources

Halt any ground disturbing activities if cultural resources are discovered until a Forest Service approved Archaeologist can properly evaluate and document the resources in compliance with 36 CFR 800.

2.9.5. Recreation

1. Use of helicopter landings located within the Lochsa and Selway Wild and Scenic River corridors would be limited to low recreation use periods (Nov. 1 – April 15; this may overlap with Wildlife timing restrictions for bald eagles). Helicopter landings located at Wild Goose and Johnson Bar Campgrounds would be used only one season each. Each site would be fully rehabilitated (debris removed and surfaced returned to pre-use conditions) by May 15. Other landing sites within the river corridors, such as Two Shadows, would be rehabilitated within 6 months of last use, including any required slash removal, grading, seeding, rock replacement and paving.
2. Between June 1 and October 15 of each year's projected activities, at least one access route (Road 286 or 651) to Lookout Butte Rental would be available for Forest visitors to use and access the site.
3. Designated trails 706, 712, 715, and 716 would be identified as protected improvements. Following harvest activities, any impacts to these trails would be restored to the same useable condition they were prior to the activity taking place.
4. Where necessary for public safety, recreation access for activities, such as mushroom hunting/collecting, dispersed camping, hunting, and other activities would be restricted during harvest operations.
5. If the groomed snowmobile route is used for winter log hauling an alternate parking location would be provided for snowmobilers. Location would be coordinated with the Idaho County Groomer Board and Valley Cats Snowmobile Club.
6. Dispersed campsites at helicopter landings H17, H18, and H19 would be restored following use. Restoration of campsites may include removal of slash and debris and creation of a relatively flat area suitable for camping, similar to pre-use conditions. These are existing landings that would not be obliterated after use.

2.9.6. Vegetation

1. Tree retention would be based on Region 1 tree survival guidelines (commonly referred to as the Scott Fire Mortality Guidelines) outlining ground, bole and crown scorch to determine tree survivability.
2. All live trees would be designated as "leave trees".
3. Salvage dead trees leaving 14-28 live or dead reserve trees.
4. Meet desired future stand conditions.
5. Plant 300-400 trees/acre of early seral species, i.e. western larch, western white pine, ponderosa pine, and Douglas fir in unstocked areas, as funding permits.

2.9.7. Scenic Quality

Harvest unit boundaries that are visible from critical viewpoints, such as Highway 12, Fenn Ranger Station, Fenn Pond, Johnson Bar Campground, Wild Goose Campground, Three Devils Picnic Area, and the Selway River Road, would be designed to meet the Forest Plan visual quality objectives for these visually sensitive areas. Design features used to reduce the visual impact of the harvest areas include, but may not be limited to the following:

a. Vertical structure within the harvest units would be maintained and feathered edge treatments would be used to emulate natural openings in areas visible from critical viewpoints and travel corridors. Leave trees that provide vertical structure within the harvest area, may be both live and dead trees emulating the same structure that would remain after a natural mixed severity wildfire. These leave areas would be grouped in retention areas ranging from ¼ to 3 acres in size and may include leave areas adjacent to unit boundaries. Unit boundaries for openings visible in the foreground would be shaped and feathered to reduce any unnaturally shaped edges and would reduce the hard edges that appear as a man-made features on the landscape.

b. Foreground screening vegetation along the Swiftwater Road would be protected where ever possible. Protection of screening vegetation at these critical areas would be important during harvesting activities.

c. Location of skyline corridors and skid trails would be designed to minimize visual impacts.

d. Harvest units would be designed so that the edges of the unit emulate natural edge patterns with a minimum of geometric lines.

2.10. Monitoring

The following monitoring activities would continue or be initiated as a component of the proposed project:

1. PACFISH buffer monitoring would be conducted annually by the Forest Fisheries Biologist in conjunction with BMP audits. Monitoring would be conducted on randomly selected treatment units throughout the Forest and results would be made publicly available on the Forest’s website. Both implementation and effectiveness of treatments would be monitored. Additional PACFISH buffer monitoring would be conducted. The focus would be on whether or not sediment travels from harvested and burned units into PACFISH buffers, and also how far the sediment travels and whether or not it reaches a stream. It would be funded and conducted pursuant to PL111-11 Title IV Section 4003(g)(4).

2. Annual Cobble Embeddedness monitoring on Swiftwater, Elk City, Goddard and O’Hara creeks.

3. PACFISH/INFISH Biological Opinion (PIBO) effectiveness monitoring will be ongoing (3-5 year rotation) within the Selway and Middle Fork Clearwater subbasin. There is one PIBO EM site located within the specific Project Area, located on Goddard Creek.

4. A Forest Plan Monitoring Site has been established on O’Hara Creek. PACFISH riparian management objectives (RMOs) along with fish density are measured on an annual basis.

5. Soil plots were established to measure differences in soil disturbance among varying logging systems by burn severity. Soil plots were also established to measure spatial and temporal changes in soil erosion by burn severity. Monitoring is ongoing, before implementation of the project, during, and post implementation.
6. Post implementation effectiveness monitoring of target stands and Design Criteria would be performed as an interdisciplinary team at selected harvest units.
7. Resource specialists would conduct field evaluations of selected tractor logging units during harvest operations.
8. Specialists would evaluate the effectiveness of soil erosion prevention and control measures.
9. Temperature monitoring would continue in the lower Selway Watershed (Selway River and O'Hara Creek).
10. Evaluation of treatment of invasive plant species monitoring is conducted by the noxious weed program.

CHAPTER 3

AFFECTED ENVIRONMENT and ENVIRONMENTAL EFFECTS

This section summarizes the physical, biological, social, and economic environments of the proposed project area and the potential changes to those environments as a result of implementing the proposed alternatives. It also presents the scientific and analytical basis for comparison of each alternative.

This section also summarizes the potential direct, indirect, and cumulative effects to the Affected Environment as a result of implementing the proposed alternatives. Effects may include ecological, aesthetic, historic, cultural, economic, social, or health. The potential effects may be beneficial or detrimental, and may result from actions possessing both beneficial and detrimental effects, even if on balance the effect would be beneficial (40CFR 1508.8).

Direct and Indirect Effects

NEPA requires that federal agencies take a "hard look" at significant environmental effects as a result of implementing a proposed action and any alternatives. The "hard look" requirement has been tempered through the "rule of reason", which the Supreme Court has characterized as requiring an agency "to furnish only such information as appears to be reasonably necessary under the circumstances for evaluation of the project rather than to be so all-encompassing in scope that the task of preparing it would become either fruitless or well nigh impossible" [*New York Natural Resource Defense Council, Inc. v. Kleppe,* 429 U.S. 1307, 1311 (1976), citing *Natural Resource Defense Council v. Calloway,* 524 F2d 79, 88 (2d Circuit 1975)].

Direct effects are the result of an action and occur at the same time and place. Indirect effects are the result of an action but occur later in time or are further removed in distance, yet are still reasonably foreseeable (40CFR 1508.8). In order for an impact to be considered reasonably foreseeable, it must be "sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision" [*Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Circuit 1992)].

3.1 Cultural

3.1.1 Analysis Area

The analysis area consists of the entire Johnson Bar Fire Salvage project area.

3.1.2 Regulatory Framework

The Nez Perce National Forest Plan direction and all Federal and State laws and regulations applicable to cultural resources would be applied to the proposed project.

3.1.2.1 National Historic Preservation Act

The Forest Service is mandated to comply with the National Historic Preservation Act (NHPA) of 1966 (Public Law 89-665) and its amendments. Section 106 of the NHPA requires that Federal agencies with direct or indirect jurisdiction over Federal, federally assisted, or federally licensed undertakings afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity for comment on such undertakings that affect properties included in or eligible for inclusion in the National Register of Historic Places (NRHP) prior to the agency's approval of any such undertaking (36 CFR 800.1). Historic properties are identified by a cultural resource inventory and are determined to be either eligible or not eligible by the cultural resource specialist in consultation with the SHPO. Sites that are determined to be eligible are then either protected in-place or adverse effects must be mitigated.

Each cultural property is evaluated against four strict standards in a process to determine that properties historical significance for possible inclusion in the National Register of Historic Places. These criteria address specific elements that may be contained within that specific property. These criteria are found in the Code of Federal Regulations, 36 Part 60.

Criteria A: the quality of significance is associated with events that have made a significant contribution to the broad patterns of our history; or

Criteria B: that are associated with the lives of persons significant in our past; or

Criteria C: that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

Criteria D: that have yielded, or may be likely to yield, information important in prehistory or history.

3.1.2.2 Nez Perce National Forest Plan

The alternatives would comply with the Nez Perce National Forest Land and Resource Management Plan relevant to Cultural Resources. The 1987 Forest Plan and amendments document goals, standards, and management directions for Cultural Resources within the forest boundary. Forest-wide management direction or standards would apply to this project.

3.1.3 Analysis Methodology

Data presented are the result of reviewing existing information available for the proposed project area. Documents reviewed included previously completed cultural resource inventory reports, historic property site records, historical forest maps, and other historic documents. The indicator used for cultural resources are the number of sites affected by proposed project activities. In accordance with the NHPA, as amended, a cultural resource inventory of the proposed project was completed. The findings of the inventory would be submitted to the Idaho SHPO for review and concurrence.

3.1.4 Affected Environment

The project area has seen numerous changes in human land use patterns. From its earliest Native American inhabitants who lived in and traveled through the area utilizing its resources, to the families who homesteaded and settled in the area, to the minerals exploration from the mid-1800s into the early 1900s, the region witnessed several waves of occupation through time. Each group interacted with the environment in their own way, extracting various products and manipulating it to their benefit when possible.

There have been six previous cultural resource surveys conducted in the proposed project area. There are twenty-three previously documented cultural resource properties located within the boundary of the analysis area. Nine of these properties are eligible for the National Register of Historic Places (NRHP), thirteen sites are not eligible, and one site is unevaluated.

3.1.5 Direct and Indirect Effects

The four alternatives would have varying effects on the twenty-three known cultural properties. Alternative 1 would have no effect to historic properties. Historic properties would continue to degrade naturally. There would be no change in effects from the current condition. Under Alternatives 2, 3, and 4, five cultural resource sites would be located within the proposed project activity areas. All five sites have been determined to be not eligible for the National Register of Historic Places (NRHP). As these sites are not eligible for the NRHP there would be no effect to cultural resource properties; therefore, no mitigation would be required. National Historic Preservation Act compliance would be obtained from the Idaho State Historic Preservation Office (SHPO) prior to the project decision.

3.2 Economics

3.2.1 Analysis Area

The Johnson Bar Fire Salvage project area is located within Idaho County, Idaho. The economic analysis area includes local towns and communities influenced by the timber sale activities. These towns include Grangeville, Kamiah, Kooskia, Orofino, Pierce, Weippe, and Lewiston, Idaho, plus many small towns in between. The influence is based on their geographic location to the watershed, economic dependence on it, and use of it, dating back to settlement of the area more than 100 years ago. The Nez Perce and Clearwater National Forests have provided wood to local mills since the 1930s. The Forests' output, along with Bureau of Land Management (BLM) timber outputs, accounted for half of the total timber harvested in Idaho County during the mid-1990s. Most of it was processed in mills located in or near the towns mentioned previously.

3.2.2 Regulatory Framework

The proposed Johnson Bar Fire Salvage project would comply with the Forest Plan direction to develop cost effective projects and with the National Forest Management Act (NFMA) by emphasizing resource management over timber volume output.

3.2.2.1 National Forest Management Act

The NFMA requires that a sale "consider the economic stability of communities whose economies are dependent on such national forest materials, or achieve such other objectives as the Secretary deems necessary" (NFMA Section14, e,1,c) and "the harvesting system to be used is not selected primarily because it would give the greatest dollar return or the greatest unit output of timber" (NFMA, Section 6, g,3,E,IV). The proposed project would meet the requirements of the NFMA by considering the economic community stability through the IMPLAN model evaluation of the alternatives. Also, the harvest systems are based upon ground-truthed silvicultural practices to achieve the desired long-term forest and access needs, and not on the highest dollar return.

3.2.2.2 Forest Service Manual

The Forest Service Manual directs that economic feasibility be considered in project design, during the early planning stages and NEPA documentation. A sale feasibility analysis was completed at Gate 1, which led to consideration of economic adjustments to the alternatives in order to reflect ways in which to lower costs, such as reducing the amount of helicopter logging and high cost development of landing areas. It also highlighted the potential need for funding to cover reforestation needs caused by the Johnson Bar Fire. Since the fire caused the need for reforestation of the land, removal of the dead trees is not required in order to cover the cost of reforesting the ground. However, by removing some of the fire killed trees, there would be an opportunity to generate funds to contribute to the cost of reforesting the areas.

3.2.2.3 Nez Perce National Forest Plan

Forest Plan Goal A.1, page II-1: "Provide a sustained yield of resource outputs at a level that would help support the economic structure of local communities and provide for regional and national needs". The proposed action alternatives would help meet Forest Plan goals.

3.2.2.4 Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Although not a direct economic requirement, Executive Order 12898 requires that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories.

The Johnson Bar analysis did not reveal any disproportionately high or adverse effects to minority and low-income populations. None of the action alternatives are expected to negatively affect the consumers, civil rights, minority groups, Native Americans, women, or any United States citizen. No environmental health hazards are expected to result from implementation of any alternative. This project would not disproportionately affect income level.

3.2.3 Resource Indicators

3.2.3.1 Timber Harvest Related Jobs and Income

Jobs and income generated from the proposed project would contribute to community stability. The Nez Perce National Forest Plan Final Environmental Impact Statement (FEIS), pages IV-26 and 27, describes the economic impacts of implementing the Forest Plan (Forest Plan, USDA-FS 1987a and 1987 as amended). The Forest Plan addresses the economic analysis process and values placed on non-consumptive items, such as recreation opportunities, community stability, cultural resources, habitats, and populations (Forest Plan, Appendix B, pages 51-142). This economic analysis would not revisit the information presented in the Forest Plan and would focus only on those costs and revenues associated with implementing the proposed activities in the project area.

The Forest Service Micro IMPLAN model would be used to derive the indirect and induced economic effects. Indirect economic effects were derived from mill surveys conducted by the Bureau of Business and Economic Research at the University of Montana. The response coefficients found in Table 3-1 were developed for the 1997 Clearwater and Nez Perce National Forest market area for the Timber Sale Program Information Reporting System (TSPIRS). TSPIRS is a reporting system developed jointly with the General Accounting Office (GAO) and the Forest Service, which has been reviewed and approved by Congress.

Table 3-1: Coefficients from the Forest Service Micro IMPLAN Model to Derive the Indirect and Induced Economic Effects

Harvest Related Jobs Generated	13.5 per 1.0 MCCF
Harvest Income to Communities	$383,406 per 1.0 MCCF
Federal Income Tax Generated	$57,511 per 1.0 MCCF

3.2.3.2 Sale Feasibility

The Region One Gate 1 and 2 spreadsheet and the Quicksilver model, with the Nez Perce-Clearwater National Forest area factors, were used to determine sale feasibility and appraised value. The Quicksilver model uses recent transactional evidence based on local timber sales to determine sale value. The timber stand data base and extensive field reviews were used to determine timber volume and species composition; these are the two primary factors determining gross value of a timber sale. Net value depends on costs for the logging system, haul distance, slash disposal, planting, and cost of mitigation activities. The cost estimates for this sale are based on recent similar sales in the vicinity.

3.2.4 Affected Environment

In a report for the Interior Columbia Basin Ecosystem Management Project, titled "Rural Communities in the Inland Northwest," communities are characterized in terms of their ability to manage change and adapt to it in positive, constructive ways - "community resiliency," which is a function of community conditions, such as economic structure, infrastructure, civic leadership, cohesiveness, and amenities.

Resiliency ratings for Idaho County (Kooskia and Grangeville), Lewis County (Kamiah), and Clearwater County (Orofino, Pierce, and Weippe) are low. However, preliminary findings from a study recently completed by University of Idaho sociologists working on the Columbia River Basin assessment show that many timber-dependent communities tend to be more resilient and able to tolerate change than is commonly assumed. The resiliency rating for Nez Perce County (Lewiston) is high. The towns of Grangeville, Orofino, Weippe, Pierce, and Lewiston all show high to very high historic employment in the wood products manufacturing industry.

As of December 2014, Idaho County had an unemployment rate of 5.1%, Lewis County 3.2%, and Clearwater County 8.6% (highest in Idaho). The Idaho State average unemployment rate is 3.7% and the National average is 5.6%.

Counties dependent on Federal timber receipts as Payments in Lieu of Taxes (PILT) to help fund schools and roads have found that this source of funding has declineddue to lower National Forest timber outputs, so they have relied more heavily on taxes to bolster their income. The PILT distribution process was revised under the Secure Rural School and Community Self-Determination Act of 2000, P.L.106-393 (SRS). This revision allowed counties to select “full payment” of the high three years of National Forest Receipts, rather than rely on yearly timber sales or National Forest funds. Currently SRS has not been approved, which means Counties would resort back to the PILT process. Stewardship contracting, if used, would not contribute towards any PILT payments.

Idaho has been a natural resource-based state since the 1800s, although as natural resource extraction declines, there is some movement toward diversification. Many communities have made impressive strides in achieving Idaho Gem Community status and are working towards diversifying their economies. (The Gem Community program was established by the Idaho Department of Commerce to encourage communities to plan their futures). As reported by the Idaho Department of Labor, the timber products industry went through hard times in the early 1980s, but those firms which survived were streamlined and modernized with the hope of having a consistent supply of timber from National Forest administered lands.

3.2.5 Direct and Indirect Effects

Employment and income effects attributable to Forest Service timber management are derived from the harvesting and processing of timber. Timber harvesting and processing requires the employment of loggers, truck drivers, mill workers, and a variety of workers in logistical support (road grader operators, back hoe operators etc.). In addition, if a project is not cost effective, it would not sell, which then would cause it to not contribute towards the Forest’s timber output and community stability.

The logging contractors, wood processing plants, county road departments, and public schools must purchase materials and labor to perform their functions. These purchases produce indirect effects. Induced effects are the result of spending by workers directly employed in the timber industry and by workers that are in part supported by dollars generated by the timber industry, such as grocery and equipment stores. This chain of purchases travels through the local community until the timber dollars leave the local market area and become part of the national economy.

Table 3-2 displays the Job and Income effects as a result of implementing the timber harvest alternatives. The numbers do not reflect additional jobs and income related to the implementation of the non-timber harvest road decommissioning. The road decommissioning would generate some additional jobs and income, but not to a level like the timber harvest, and would not point to any action alternative as generating more than the other, because the decommissioning is the same for all the action alternatives.

Alternative 1 would not sustain any timber harvest jobs. Alternative 2 would generate the most jobs and revenue, because it generates the most timber volume. Alternatives 3 and 4 would be behind Alternative 2 based upon volume harvested.

Table 3-2: Timber Harvest Jobs and Income for Each Alternative

Alternative	VOLUME (CCF)	Jobs Sustained	Community Harvest Income	Federal Income Tax
1	0	0	0	0
2	82,100	1108	$31,476,000	$4,721,000
3	70,800	956	$27,163,000	$4,074,000
4	64,200	867	$24,616,000	$3,692,000

Each alternative would produce a different level of benefits and costs associated with the timber harvest, road work, fuel treatment, reforestation, mitigation measures, design criteria (skid trail decompaction), and other related timber harvest activities. This part of the economic analysis focuses on the relative differences in these benefits and the associated costs between alternatives by displaying Predicted Bid Rates and Present Net Value (PNV) and is summarized in Table 3-3. The Predicted Bid Rate is the dollar amount, based on recent bidding, that the Nez Perce National Forest anticipates the timber would sell for. The PNV is the anticipated selling value minus the costs of implementing the sale. An alternative having a positive PNV would have stumpage values exceeding costs, where-as an alternative with a negative PNV would have costs in excess of stumpage values and may require supplemental funding in order to complete all of the activities.

Information provided by the economic models is used as a tool to understand the relative monetary differences between alternatives rather than to predict actual values for each alternative, since the variables may change between now and the time the timber sells.

Alternative 1 would not generate any values nor have any costs associated with the NEPA decision, so its PNV would be zero. However, a No Action alternative would make no effort to offset the $120,000 cost of completing the NEPA analysis. Also, the fire impacted trees would continue to deteriorate and decrease the economic timber values to zero. As the trees deteriorate they would fall down and contribute to down fuel loadings over the next 20 years, which would enhance the chance of a reburn, which is discussed under the No

Action Alternative in the Fuels Section. The Johnson Bar fire cost $13,000,000 to contain and suppress. A higher intensity reburn would likely cost a similar amount to suppress. Selection of Alternative 1 would not promote reforestation of the area, which could delay site recovery and future long-term timber management.

Alternatives 2 and 4 are predicted to generate enough stumpage value to cover all of the sale costs, plus reforestation, while also capturing the timber value before it deteriorates. Alternative 3 would pay for the timber harvest, but would not cover all of the reforestation costs. All three of the action alternatives would be sellable if supplemental funding is used to cover some of the reforestation costs incurred under Alternative 3. Although Alternative 4 would not generate the highest volume output, it is the most economically feasible and would generate the highest revenue, primarily because it would include fewer helicopter treatment areas, which incur the highest costs.

All of the alternatives would be highly susceptible to market value changes caused by deterioration in the trees, to the point that if the recovery of the trees is delayed too long, there would be no economic value left, except for some of the cedar as a low value cedar product. Some trees near Hot Point burned so hot that they do not currently have any timber value. However, the majority of the fire area burned with a hot ground fire that killed the tree roots, which leaves the tree needles with no nutrient source to sustain the tree. These trees appear green right now and have only lost a little of their sawlog value due to the fire, but would start to turn brown towards the end of 2015 and into 2016, at which time the value would drastically decrease.

Only Alternative 4 would generate enough funds to cover the $220,000 NEPA analysis costs; however, the pre-decisional NEPA costs are not an outcome of the NEPA decision and therefore are not included in the economic analysis.

Alternatives 2 and 3 differ in costs due to the amount of harvest area being treated. The differences in the area being treated were influenced by the amount of temporary roads planned by the alternatives. The temporary roads planned under Alternative 2 would not only provide access to more area, but would also reduce skidding costs by shortening the skidding distances. Alternative 3 would have a higher harvest volume per acre, because some of the areas dropped due to no access were also the areas hardest hit by tree mortality, which resulted in low merchantable volumes per acre.

Helicopter logging is the Forest’s most expensive log removal method available, and for this project it would have the greatest effect on an alternative’s feasibility. Because logging helicopters are not a local business and are limited nationally, their availability would be dependent upon what other work they are committed to performing. Alternative 4 would have the least amount of helicopter logging (34% would be helicopter logged), which would result in the highest sale value. In response to potential watershed concerns and fisheries effects, Alternative 3 was developed, which would reduce the amount of soil disturbance by not building roads or landings and minimizing tractor logging. This would result in Alternative 3 using more helicopter logging (59% would be helicopter logged), and consequently, would result in the lowest sale value out of the three action alternatives. A direct bearing on helicopter costs is the amount of time it would take (a factor of distance and time to hook logs to the helicopter longline) to fly from the log pick-up point to the landing where it would drop them off; the longer the flight distance, the higher the cost. For the value of the project area timber, the goal was to provide a helicopter landing within an average of 3,000 feet of the harvest area center and with a maximum flight distance of 1 mile to the back of the unit. Alternatives 2 and 3 exceeded this target distance with an average of 4,600 feet and 4,200 feet respectively.

Another key factor in helicopter logging costs is the size of the logs being hauled, which equates into the amount of time it would take to hook a full payload onto the helicopter; small logs generally take longer to get a full helicopter payload. The tree’s top logs would constitute the small logs for this project. In light of the fact that small tree tops would cause higher logging costs, and that the small tops would have less value due to deterioration, plus the need to retain coarse woody debris on site, a design criteria that allows a variable top diameter would enhance the sale feasibility of all of the alternatives, if other resource objectives, such as fuel loadings, could be met.

In addition, reforestation costs would be high for all of the alternatives (Table 3-3). In order to reduce the effects of reforestation costs, natural regeneration could be implemented where possible, and where it is determined to meet the project purpose and need and not delay site recovery.

Road decommissioning costs listed in the following table are associated with maintaining an upward trend in these watersheds are not mitigation measures required for the timber harvest. Funding for the road decommissioning would be secured through the Forest’s watershed restoration funds if needed. If the timber values are high enough, stewardship contracting, which uses the timber value to pay for restoration work could be used.

Table 3-3: Predicted Stumpage and Present Net Value Under Each Alternative

Alternative	Volume CCF	Volume MBF	Appraised Total Value[1]	Reforesta-tion[2]	Implementation[3]	Present Net Value	Road Decommis-sioning[4]
1	0	0	0	0	$0	$0	0
2	82,000	41,900	$1,851,000	$1,730,000	$169,200	-($48,200)	$150,400
3	70,800	36,200	$400,000	$1,487,000	$166,800	-($1,253,800)	$150,400
4	64,200	32,800	$4,166,000	$1,340,000	$156,500	$2,669,500	$150,400

[1] Appraised value predicted high bid includes skid trail decompaction and road costs associated with the harvest.
[2] Reforestation costs include planting costs with overhead.
[3] Implementation costs include presale, engineering and administration costs. NEPA costs, which total about $120,000, are not included in this cost total.
[4] Road decommissioning consists of unneeded roads that are not used for the timber harvest. Unneeded roads used for the harvest would be decommissioned as part of the sale and are included in the appraisal costs.

3.3 Fire and Fuels

3.3.1 Analysis Area

The area of analysis is the entire Johnson Bar Fire Salvage project area.

3.3.2 Regulatory Framework

All alternatives would be in compliance with all applicable regulations, guidelines, and plans.

3.3.2.1 Clean Air Act

The Clean Air Act, passed in 1963 and amended numerous times since then, is the primary legal authority governing air quality management. This Act provides the framework for National, State, and local efforts to protect air quality. The Montana/Idaho State Airshed Group was formed to coordinate all prescribed burning activities in order to minimize or prevent impacts from smoke emissions and ensure compliance with the National Ambient Air Quality Standards (NAAQS) issued by the Environmental Protection Agency (EPA), the federal agency charged with enforcing the Clean Air Act. The Forest Service, including the Moose Creek Ranger District, is a member of this Airshed Group. The Project area is in North Idaho Airshed Unit 13. All post-harvest site preparation and fuel reduction treatments would be conducted according to the requirements of the Montana/North Idaho Smoke Management Unit guidelines.

3.3.2.2 Nez Perce National Forest Plan

The proposed project meets the Nez Perce National Forest Plan's specific fire management goals for this area:

- Protect resource values through cost effective fire and fuels treatment through the utilization of material and using prescribed fire (page II-2)

The modified fuel bed would decrease the probability of high intensity fires and increase firefighter effectiveness, reducing the probability of resource damage at lower cost while utilizing wood fiber.

3.3.3 Analysis Methodology

Two fire affected stands were modeled for resistance to control and fireline intensity based upon tons/acre greater than 3 inches in diamater from stand data collected in 2012 using Field Sampled Vegetation (FSVEG) data collection protocol (Stand 1- Stand ID 01170702040046; Stand 2- Stand ID 01170714010100). Both stands are predominantly cedar and grand fir. Both stands had similar basal area (Stand 1: 186 feet^2/acre, Stand 2: 189 feet^2/acre) but one has a composition of smaller diameter trees while the other is skewed toward larger diameter trees (Stand 1: 1,913 trees/acre, Stand 2: 441 trees/acre.)

Stand 1 is considered a typical tree diameter size stand for the project area while Stand 2 is considered a larger diameter size stand.

For future trend projections across the project area, the Fire and Fuels Extension (FFE) (Reinhardt, 2003) to the Forest Vegetation Simulator (FVS) (Stage1973) was used to simulate the effects of the No Action and Action Alternatives. The First Order Fire Effects

Model (FOFEM) (Reinhardt, *et al*. 1997) was also utilized for fire effects, such as smoke production.

Stand 1 was modeled for the No Action and action alternatives using 50% mortality as an average across the actual burn perimeter in order to calculate direct and indirect effects. The Salvage treatment would be total removal of all fire killed trees and thinning from below removal, leaving 15 of the largest trees per acre. These trees left would be in addition to any unburned islands (part of the unburned 50%) or areas excluded due to riparian/wet areas as defined by PACFISH guidelines. Stands 1 and 2 were modeled (S1-All Black, S2-All Black) as high severity burns (100% mortality) for indirect effects.

3.3.4 Resource Indicators

Issue: Fire killed/affected trees would fall over time, increasing surface fuel loadings, which would trend upwards over time from the recommendations for this forest type. This could lead to higher intensity or severity fires that would be difficult and costly to control, such as occurred with the Johnson Bar fire.

Indicator: Surface fuel loading in tons/acre [greater than 3 inches diameter (>3 in)] per Graham 1994 to provide positive values for other affected resources while avoiding excessive fire hazard (Brown, 2003). These levels are 17-32 ton/acre >3in.

Several fire/fuels related effects may be derived from this indicator:

Fireline intensity is synonymous with the terms “Byram's fire intensity” (Scott, 2007) and “frontal fire intensity.” It is the numerical product of a fire's rate of spread, fuel consumption, and heat yield at a given point on a fire’s perimeter. It is a common method to show visually the effects of increasing flame lengths on the type of suppression resources and tactics that may be required as surface fuel loadings increase. These categories can be broken up by flame length and displayed on a fire behavior fire characteristics chart (Rothermal, 1972). Lower values are usually beneficial from a fire suppression aspect. Fireline intensity is causally related to severity (Summers, 2011), which measures effects to other resources, such as soils. In general, the higher the intensity the greater the severity.

Related to this is resistance-to-control, which is an estimate of the suppression force required for controlling a unit of fire perimeter. It is a subjective rating meaure, such as ‘low’ or ‘extreme’, but is correlated to the size and distribution of fuels based on the time and effort to secure the unit of fire perimeter. A rating such as ‘low’ may be easy walking and minimal chainsaw work with few firefighters and no aviation resources needed; whereas, an ‘extreme’ rating may be very difficult walking and the need for heavy equipment and aviation resources. A broad interpretation would interpret a surface fuel loading of 15-40 as ‘medium’ (Brown, 2003). Resistance to control would increase suppression costs and firefighter exposure to hazards. Often fires in heavy fuel areas would cause fire managers to fall back to changes in fuels in order to attempt suppression actions because of logistical concerns, getting the equipment needed to the area, and if the increasing fire size has outstripped the on-scene resource suppression capability. Fuel reduction efforts in continuous fuels have shown a resistance to control aids in fire suppression efforts (Moghaddas, 2006).

3.3.5 Affected Environment

The Johnson Bar fire affected over 13,000 acres of forested landscape to some degree, from a light surface fire with little overstory tree mortality to total stand replacement fire with complete overstory tree mortality. These dead trees would contribute to the surface fuel loads and the spread of future fires. Based on fire history and possible future weather changes, the ignition risk should remain the same or higher.

Current Conditions: The habitat groups found within the fire consist of groups 5 and 6 from the Nez Perce-Clearwater National Forest Target Stand Groups. The habitat types in Group 5 (moderately cool and moist western red cedar) are characterized by mixed species stands of western red cedar, grand fir, and Douglas fir, with diverse shrub and forb understories. Western white pine, larch, and ponderosa pine are less frequent components. Cedar/Clintonia is the habitat type in this group most frequently found. These habitat types are common in the western portion of the subbasin on lower slopes and northerly aspects, but become increasingly rare toward the headwaters. The habitat types in Group 6 (moderately cool and wet western red cedar) are characterized by stands of grand fir and western red cedar.

Fuel models incorporate fuel characteristics such fuel load by size class and category (live or dead), fuelbed depth, etc., to group similar vegetation types for use in fire behavior models.

Prior to the fire, the Fire Behavior Fuel Models (FM) were primarily FM8 (closed short-needle timber litter) and FM10 (mature/over-mature timber and understory). FM8 has lower surface fuel loadings and flame lengths while FM10 has higher surface fuel loadings and flame lengths. Based on fire severity mapping within the actual fire perimeter (not including the unburned areas incoporated in the remainder of the project area), the following approximate percentages of fire severity were mapped. The Johson Bar fire burned through an area of approximately 13,000 at a cost of approximately $13,500,000.

Table 3-4: Approximate Percentages of Fire Severity within the Project Area

Severity Classification	Percent Area Affected	Approximate Acres
Unburned	12	1,597
Low	41	5,455
Moderate	43	5,721
High	4	532

***High severity represents less than 25% of the remaining overstory alive; moderate severity represents 25-75% of the remaining overstory alive; while low has 75% or greater overstory alive at the time the data was processed. (LANDFIRE, 2013)**

3.3.6 Direct and Indirect Effects

3.3.6.1 Alternative 1

Under this alternative, no treatments are planned; therefore, fuels would continue to naturally cycle through decay and growth.

Direct effects: Surface fuels greater than 3 inches (>3 in.) would begin to accumulate to about pre-fire levels after 20 years in modeled Stand 1(No Action) as the fuels consumed by the fire are replaced by falling snags and remain relatively constant afterwards across the entire area. Levels would remain between 40 and 80 tons/acre over the next 40 years which are above the recommended 17-32 tons/acre >3 in. (See Figure 1,). Fire intensity and severity would be higher than desired, which may have undesirable effects to resources (See Figure 2,). Fires established at these fuel loadings are generally sustained until there is a change in fuels, such as a break in continuity occurs. Since no breaks in fuel continuity would occur (See Figure 3,) as a result of lowering the surface tons/acre, the No Action alternative and areas of high severity (S1-All Black, S2-All Black) resistance to control would remain high, or above, and would continue to increase, which would increase suppression costs and firefighter exposure.

Indirect effects: Smoke particulate matter (PM 2.5) would increase across all non-treatment scenarios (See Figure 4,). PM 2.5 is a measure of fine particles 2.5 microns and smaller that are produced from activities such as the burning organic matter. Higher levels of PM 2.5 are considered a health risk and can impede visibility.

3.3.6.2 Alternatives 2, 3, and 4

Under the action alternatives, dead trees would be harvested on approximately 2,400 or fewer acres along road systems, primarily located along ridgelines. Live islands of trees and areas within PACFISH buffers would be excluded, leaving a mosaic of treated and untreated areas within the harvest units. Harvested areas would retain approximately 15 of the largest trees/acre, not including the exclusions listed above.

Direct effects: Surface fuels >3 in. would be reduced to preferred levels and would slowly decrease over time as decaying overtakes growth (Salvage trendline does not factor into mitigation actions in order to maintain minimum levels in figure 1). Flame lengths would decrease to below 4 feet and fireline intensity would drop in treated areas, allowing the potential for less impactive suppression tactics (See Figure 2). Effects to resources from fire severity should be considerably less than under the No Action alternative, although fuels would continue to increase outside of the treated areas (S1-All Black, S2-All Black), which would still have undesirable effects to resources. Barriers to the spreading of fires, utilization of the existing ridge-top road systems, and aerial extraction would lower the resistance to controls in treated areas from fires entering from untreated areas (See Figure 3,). This should decrease suppression costs and firefighter exposure by providing areas where escaped fires could be contained on a smaller scale, while allowing for faster access through the utilization of the established transportation system.

Indirect effects: Smoke particulate matter (PM 2.5) would decrease by approximately 60% (See Figure 4,).

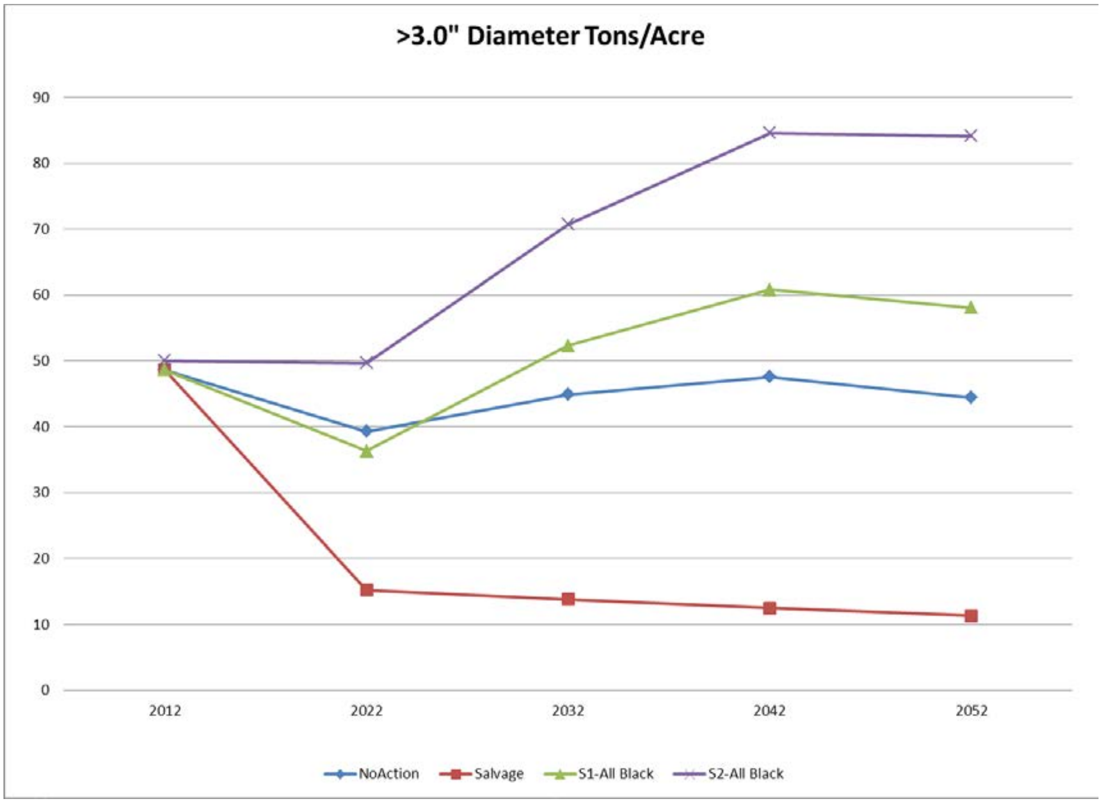


Figure 1: Surface fuels (tons/acre) greater than 3 inches in diameter projected over 40 years. Fuel Model 8 is equivalent to the Salvage treatment; Fuel Model 10 is equivalent to the other scenarios.

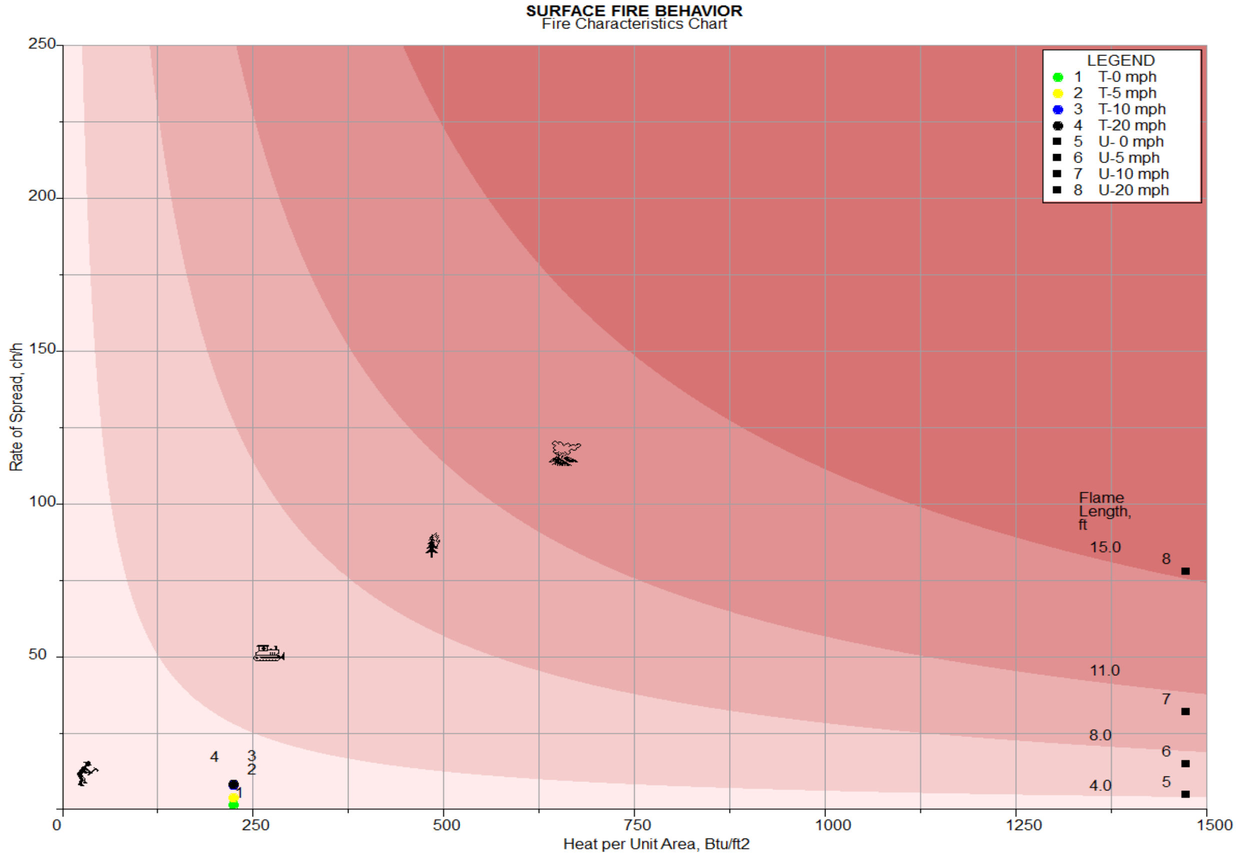


Figure 2: Fire behavior characteristics chart showing treated and untreated stands under the same environmental variables (T-treated, U-untreated)

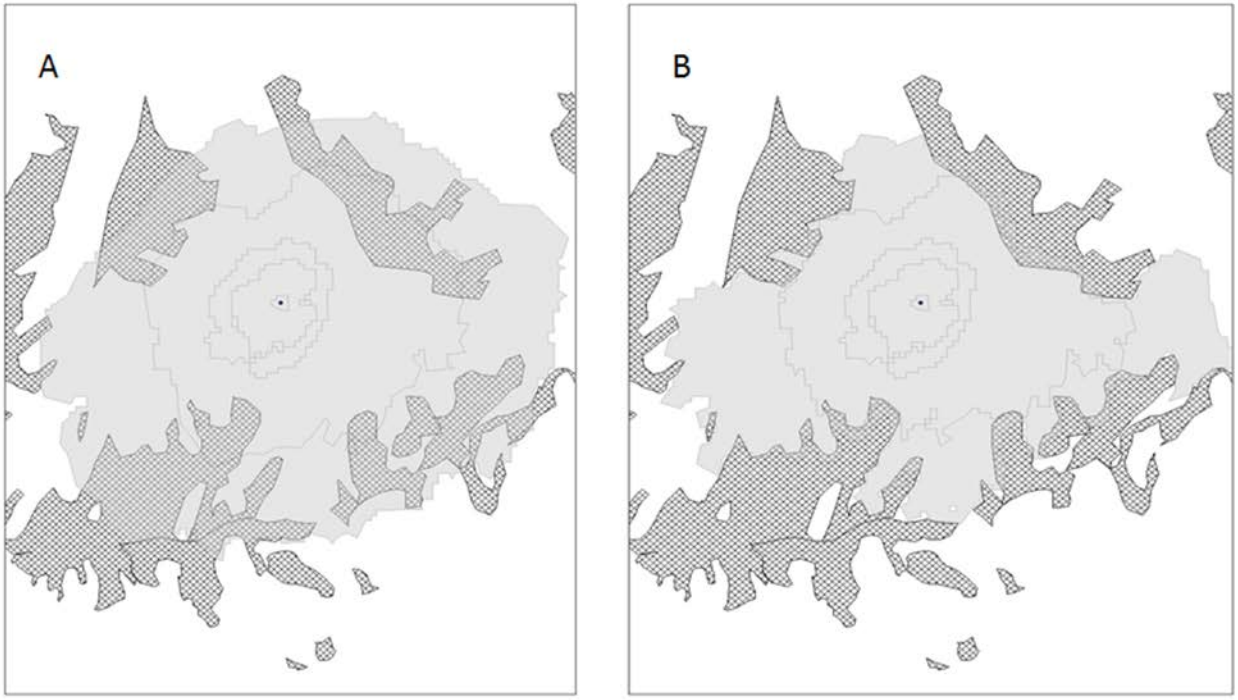


Figure 3: Simulated fire under identical conditions to show effects of treatment units as barriers to fire spread. Solid area is simulated fire spread, cross-hatched areas denote treatment units. Depicted area is in northern portion of project area. A: No Treatment. (Treatment areas shown for reference) Fire spreads in all directions. B: Salvage Alternative 2. Fire is slowed by treatments. Alternatives 3 and 4 are similar but would have fewer barriers to fire spread.

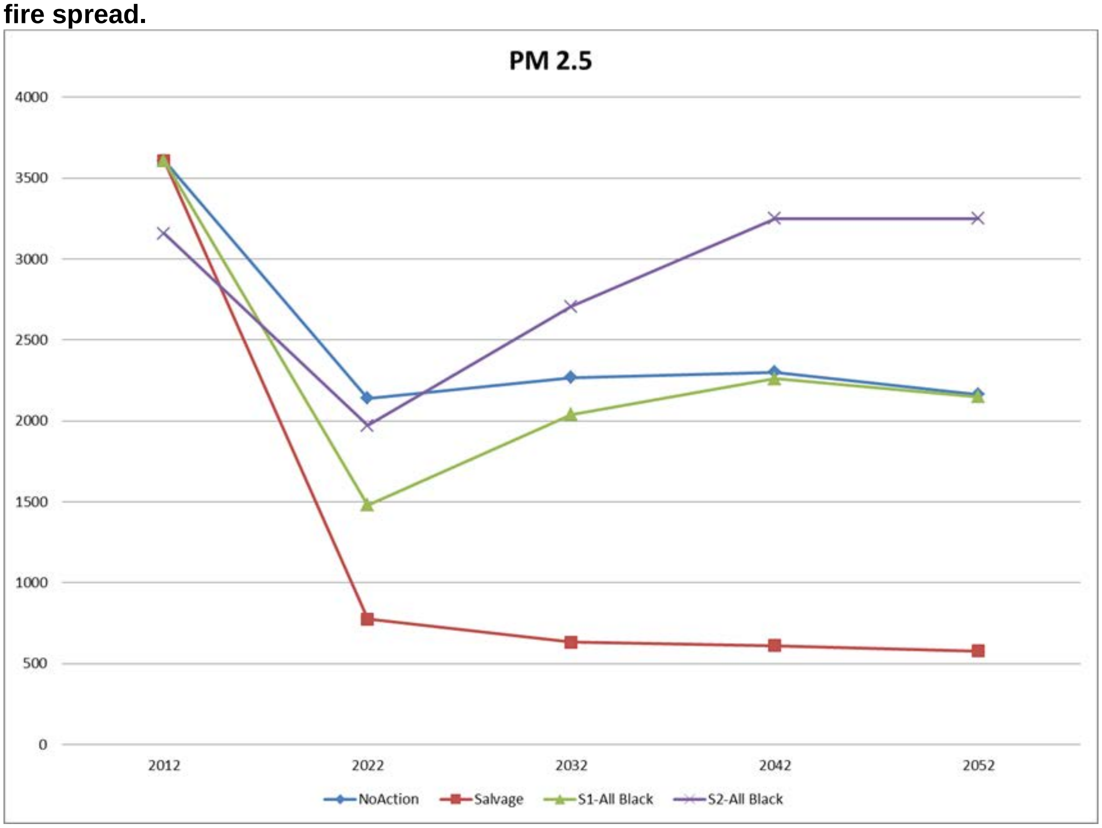


Figure 4: Smoke particulate matter (PM 2.5) over time

3.4 Hydrology

3.4.1 Analysis Area

The proposed Johnson Bar Fire Salvage project area (26,790 acres) is located within the Middle Fork Clearwater River Watershed (5th level Hydrologic Unit Code—HUC # 1706030402) and Gedney Creek-Selway River Watershed (5th level HUC # 1706030204). The project area drains to the lower Selway and Middle Fork Clearwater Rivers.

3.4.2 Regulatory Framework

Nez Perce Forest Plan direction and all Federal and State laws and regulations applicable to watershed resources would be applied to the proposed Johnson Bar Fire Salvage project, including the Clean Water Act, Idaho State Water Quality Standards, Idaho Forest Practices Act, Idaho Stream Channel Protection Act, and Executive Orders 11988 and 11990.

The Johnson Bar Fire Salvage project was designed to meet the Clean Water Act, Idaho State Water Quality Standards, Forest Practices Act, Idaho Stream Channel Protection Act, and Federal Executive Orders 11988 and 11990. As discussed in this report, project activities may result in short-term increases in erosion and probability of sediment delivery (e.g. from road improvement and decommissioning), but would result in long-term reduction in probability of erosion and sediment delivery to streams. In particular, hillslope slash application would act as a burned area emergency response (BAER) treatment to reduce erosion and sediment transport off of burned hillslopes where treatments would occur. Thus, all major streams in the project area are predicted to have maintained or improved water quality conditions as compared to the existing condition, and would continue to support beneficial uses.

Forest Plan standards for water (pages II-21 to 22 and Appendix A) would apply to this project and would be met.

3.4.2.1 Nez Perce National Forest Plan

Forest standards for water resources are found in the Nez Perce National Forest Plan on pages II-21 through II-22 (USDA 1987) and include:

- Apply best management practices to project activities to ensure water quality standards are met or improved;
- Use R1/R4 sediment and water yield guidelines;
- Evaluate site specific water quality effects and complete cumulative watershed effects analysis; and
- Meet fish/water quality objectives as outlined in Forest Plan Appendix A (including Forest Plan Amendments 5, 11, and 26) - Guidelines for percent sediment yield over base and entry level frequency per decade are established to approximate the maximum sediment yield allowable to meet fish/water quality objectives.

The Nez Perce National Forest Plan was amended in 1995, following a joint decision (commonly called PACFISH) by the U.S. Forest Service and Bureau of Land Management for managing anadromous fish-producing watersheds on Federal lands (Forest Plan

Amendment 20). This amendment also includes direction for restoration opportunities and cooperation with other agencies and individuals. PACFISH buffer widths exceed state best management practice standards.

3.4.2.2 Clean Water Act

The Clean Water Act stipulates that states are to adopt water quality standards. Included in these standards are provisions for identifying beneficial uses, establishing the status of beneficial uses, setting water quality criteria, and establishing Best Management Practices (BMPs) to control non-point sources of pollution. Executive Order 12088 also requires the Forest Service to meet the requirements of the Act.

Section 313 of the Clean Water Act requires Federal agencies to comply with all Federal State, interstate, and local requirements, administrative authority, and process and sanctions with respect to control and abatement of water pollution.

Section 303(d) of the Clean Water Act stipulates that states must identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). For waters identified on this list, states must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards. There are no streams in the project area listed for pollutants in the EPA approved 303(d)/305(b) 2010 Integrated report (IDEQ, 2011).

Section 404 of the Clean Water Act requires permits to remove or place fill within waters of the United States. The US Army Corps of Engineers administers these provisions. Culvert removal and replacement activities proposed under the Johnson Bar Fire Salvage project would require authorization under Section 404, through application of either nationwide or site-specific permits.

Section 402 of the Clean Water Act discusses permitting under the National Pollutant Discharge Elimination System (NPDES). In March 2013, the Supreme Court ruled that channeled runoff from forest roads did not constitute a pollutant from industrial activity and did not fall under the provisions of Section 402.

3.4.2.3 Idaho State Water Quality Standards

Environmental Protection Agency regulations require each state to adopt an anti-degradation policy as one component of its water quality standards. The objective of the Idaho Anti-degradation Policy is, at a minimum, to maintain and protect existing instream water uses and the level of water quality necessary to protect those uses (IDAPA 16.012501,01). Beneficial uses and water quality criteria and standards are identified in the State of Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02, IDAPA 37.03.02).

3.4.2.4 Idaho Forest Practices Act

This Act regulates forest practices on all land ownership in Idaho. Forest Practices on national forest lands must adhere to the rules pertaining to water quality (IDAPA 20.02.01). The rules are also incorporated as BMPs in the Idaho Water Quality Standards.

3.4.2.5 The Idaho Stream Channel Protection Act

This Act regulates stream channel alterations between mean high water marks on perennial streams in Idaho. Instream activities on national forest lands must adhere to the rules pertaining to the Act (IDAPA 37.03.07). The rules are also incorporated as BMPs in the Idaho Water Quality Standards.

3.4.2.6 Federal Executive Orders 11988 and 11990

Provide for the protection and management of floodplains and wetlands.

3.4.3 Analysis Methodology

GIS generated reports and maps, aerial photos, and field reviews were used to analyze effects to water quality and quantity from the Johnson Bar Salvage proposed activities. Resource condition observations were conducted in the field during the fall of 2014, following the Johnson Bar Fire. *Forest stand database* (FSVeg) queries were conducted to identify past harvest activities and the timeframe they occurred (see project file). Information from the Selway and Middle Fork Clearwater Rivers Sub-basin Assessment (USDA Forest Service 2001) was used to develop the existing condition and cumulative effects evaluation.

Models were used to provide estimates of existing and project-related erosion and sedimentation, as well as the approximate area absent of mature, live trees. Models used in this analysis were not validated at the sites evaluated for this project, and therefore model output presented in this report is not at a level of accuracy that allows for interpretation in absolute terms. Rather, because the models were used in a consistent manner between alternatives, model output is useful for comparison of alternatives in a relative sense. That is, model parameters were established for the baseline/existing condition, and then parameters related to proposed activities were adjusted per alternative to allow the model to estimate the effects of those activities within the existing setting.

An *equivalent clearcut area* (ECA) analysis using treatment and recovery coefficients from Ager and Clifton (2005) were used to determine existing ECA. This analysis allows for an estimation of current (post-fire) conditions. The ECA analysis takes into account the initial percentage of crown removal and the recovery through vegetative regrowth since the initial disturbance. Past harvest, wildfire, and roads were included in the analysis. Existing roads are considered as permanent openings when estimating ECA. The analysis takes a simple snapshot in time with the assumption that all Johnson Bar Fire Salvage project activities are implemented in one year. ECA predictions are used to compare alternatives and are not viewed as absolutes. This surrogate for water yield increase indicates the potential for decreased channel stability due to sustained increased energy in the stream channel.

The *NEZSED* model was used to estimate existing watershed sediment yield and potential sediment yield increase as a result of the proposed activities under Alternatives 2, 3, and 4. The model's estimates are useful in comparing alternatives to the existing condition, but are not reliable as actual instream sediment loads. NEZSED model results are also required for comparing the proposed alternative to the guidelines of Appendix A of the Forest Plan. A more detailed discussion of the NEZSED model is in the Forest Plan, Appendix A guidance document (Conroy and Thompson, 2011). Sediment yield is calculated in tons/year and reported as "percent increase over base" conditions. Sediment yield is calculated for base conditions (watershed conditions absent of natural or human disturbance), current conditions (cumulative of past and existing management activities and large-scale natural disturbances, such as wildfires, combined with base conditions), and predicted conditions for each of the proposed project alternatives (cumulative of past, existing, and proposed future activities combined with base conditions). The NEZSED model was used in this analysis primarily because it is required by the Forest Plan (1987)—it is no longer considered the best available approach to estimating sediment delivery to streams. Nevertheless, the model's output is useful in comparing alternatives and the existing post-fire conditions of the project area.

The state-of-the-science hillslope and road erosion model most commonly used in western land management applications is the *Water Erosion Prediction Project (WEPP) Hillslope Profile and Watershed Model* (Elliot *et al*. 2000). The Forest Service Road module of the WEPP model was used to predict sediment transport from roads to stream channels. Input data used to run this model were collected in the field at points where roads drain to streams during runoff. Another WEPP module (*Disturbed WEPP*) was used to predict erosion from treatment unit hillslopes. The WEPP-based *Erosion Risk Management Tool (ERMiT)* (Robichaud *et al*. 2007) was used to estimate post-fire erosion from treatment areas with and without project-related erosion mitigation measures. The ERMiT interface was developed in order to improve WEPP predictions of post-fire erosion and sedimentation, as well as the effects of post-fire mitigation measures at reducing erosion. Input data required for the ERMiT interface include hillslope, soil, cover, and management parameters.

The physical basis and performance of the WEPP models is discussed in the model documentation (Elliot *et al.* 2000, Elliot 2004, Robichaud *et al*. 2007), as well as several peer-reviewed papers (Elliot 2004, Laflen *et al*. 2004, Larsen and MacDonald 2007). In general, erosion prediction models have difficulty predicting sediment output with precision from a road, hillslope, or watershed at time scales useful to land managers. This is due mainly to a high degree of variability in site characteristics and climate. An average erosion/sediment delivery rate prediction can encompass this variability to some degree, but is more useful when combined with a probability that erosion would occur.

The WEPP models incorporate climate data tailored to the individual site using Parameter-elevation Regressions on Independent Slopes Model (PRISM) data (Daly et al. 2000) and simulate daily events for a number of years specified by the user (100 years in this analysis) to determine the probability of sediment leaving the modeled hillslope. The model incorporates individual precipitation event characteristics and moisture conditions, as well as site characteristics into its prediction of average annual runoff, erosion, and sediment yield values.

Accurately predicting erosion is difficult and subject to large errors from various sources because of highly complex processes including spatial variation in slope, soil, and vegetative conditions, and uncertainty in precipitation (Walling 1988). Therefore, applying hillslope estimates across landscapes and watersheds generalizes actual rates of erosion that may occur. Modeled erosion and sedimentation rates are recognized as highly variable. (Neary *et al*. 2005) suggest that the average erosion value produced by a model is likely to be plus or minus 50% of the observed value.

3.4.4 Resource Indicators

3.4.4.1 Water Quality and Quantity

Recently burned forested hillslopes are typically highly susceptible to erosion and elevated runoff in their natural state. Loss of organic material (soil duff) and fine woody debris reduces overland flow resistance, protection from splash erosion, and surface water storage capacity. Soils can become more water repellant, contributing to elevated runoff. Activities associated with the post-fire removal of trees have the potential to exacerbate these conditions through compaction, rutting, and displacement of soils. However, careful mitigation of potential impacts and restrictions on where and how work is done can substantially reduce the potential impact of salvage harvest operations. For example, skyline or helicopter yarding of hand-felled trees minimizes soil disturbance, and has substantially less impact on soils than tractor yarding (McIver and Starr 2001, Karr *et al*. 2004). In a treatment similar to BAER post-fire erosion control methods, scattering of fine slash to re-establish extensive ground cover throughout a treatment unit can reduce the potential for erosion below that of the untreated, post-fire condition (McIver and Starr 2001). Avoiding any activities on sensitive ground, such as riparian areas or landslide-prone hillslopes, would prevent damage to these sensitive areas, as well as to areas downstream or downslope (Karr *et al*. 2004, Beschta *et al*. 2006).

Active erosion of the landscape occurs naturally and yields sediment to streams. When chronic or excessive sediment inputs occur, a stream's ability to route the sediment through the system is reduced and water quality and aquatic habitat can be diminished. Harvest and road-related activities have the potential to increase erosion production and sediment delivery into streams.

Roads influence both water quantity and quality. They allow substantially less rainfall and snowmelt infiltration than occurs on undisturbed forest floors, intercept subsurface flowpaths, and concentrate runoff. Where connected to a stream, unpaved roads are often a source of sediment as well. While a watershed road density greater than three miles per square mile (mi/mi^2) is generally considered to be an impaired condition (NOAA 1998), lower road densities with high road-stream connectivity would likely be similarly impaired.

The balance of water yield and sediment yield in a watershed influences the water quality/quantity of a stream system. Water yield refers to stream flow quantity and timing and is a function of water, soil, and vegetation interactions. Changes in amount or distribution of vegetation can affect water yield and ultimately alter stream channel conditions. A general measure of 20-30% ECA is generally recognized as the point where water yield is increased beyond acceptable limits (Gerhardt 2000, MacDonald and Stednick 2003). While this project would remove dead trees, new landing and temporary road construction could potentially clear some green trees. Proposed activities were evaluated to determine whether they would likely contribute to a change in ECA or water yield over the existing condition.

Water Resource Indicators for this project are as follows:

- Net sediment delivery from project area roads and treatment units as modeled using WEPP (existing versus post-project conditions);
- Percent sediment yield increase over base as modeled using NEZSED;
- Watershed road density; and
- Percent increase in equivalent clearcut area (ECA).

3.4.5 Affected Environment

The proposed Johnson Bar Fire Salvage project is located near the headwaters of the Middle Fork of the Clearwater River (Lochsa and Selway River confluence). The proposed project area (26,790 acres) is encompassed by the Big Smith Creek-Middle Fork Clearwater, Goddard Creek-Selway River, and O'Hara Creek subwatersheds (6th-HUC drainages). These subwatersheds are further delineated into multiple Forest Plan Prescription watersheds. Table 3-5 displays the existing condition of general watershed indicators for watersheds within the proposed project area. Watershed boundaries and stream locations are displayed in Maps 5 and 6. There are no municipal water supplies or source waters within or adjacent to the project. Forested seeps and springs are found throughout the project area and often mark the upper extent of perennial flow. Stream channels range from headwater channels that are relatively steep and confined (Rosgen A), to lower gradient Rosgen B and C channels (Rosgen 1996). During the fall of 2014 and spring of 2015, resource technicians evaluated conditions of roads, culverts, headwater perennial and intermittent channels, ephemeral draws, and springs and seeps within and downstream of proposed activity areas. The Fisheries Biological Evaluation for this project details characteristics and conditions of project area streams.

A query of water rights was made for the areas located in the Johnson Bar Fire Salvage project area. Eleven federal and six State of Idaho water rights were identified. Uses included administrative, storage, stock water, minimum stream slow, Wild and Scenic River designation and irrigation. Further details are located in the project file. A summary of the proposed action alternatives discussed in this project would not alter any existing water rights claims nor decrease the available water relative to these claims.

Beneficial uses and water quality criteria and standards are identified in the State of Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02). Designated Beneficial Uses (IDAPA 58.01.02, Section 120) for the Middle Fork Clearwater River Sub-basin (HUC #17060304) and Lower Selway River Sub-basin (HUC #17060302) are cold-water biota, salmonid spawning, domestic water supply, and primary/secondary contact recreation. Designated Beneficial Uses for both the Middle Fork Clearwater River Lower Selway River (major streams in the project area) are cold-water aquatic life, domestic water supply, primary contact recreation and salmonid spawning. IDEQ has not completed support status assessments for either streams with the exception of the Lower Selway River is listed as fully supporting cold-water aquatic life (Final Assessment Unit Status Report 2012). The tributaries of the Lower Selway and Middle Fork Clearwater have generally not been assessed but are listed as having beneficial uses including cold-water aquatic life, secondary contact recreation, domestic water supply and salmonid spawning. The Idaho Department of Environmental Quality direction is to improve or maintain water quality conditions in order to support beneficial uses. No streams within the *Big Smith Creek-Middle Fork Clearwater, Goddard Creek-Selway River,* and *O'Hara Creek* drainages are listed for pollutants in the EPA approved 2012 Idaho Department of Environmental Quality (IDEQ) 303(d)/305(b) Integrated Report (IDEQ 2012).

Table 3-5 - Existing Condition Information

Johnson Bar Drainages	Watershed area (ac)	Road length in RHCA (mi)	Watershed Road density (mi/mi^2)	Stream-road crossings (#)	ECA† (%)
Big Smith Creek-Middle Fork Clearwater River** *6th field HUC #170603040201*	28,875 (85% Forest Service)	12.0	2.9	36	17.4
Decker Creek *Forest Plan #170603040009*	1,230 (100% Forest Service)	0.0	0.5	0	
Lodge Creek *Forest Plan #170603040007*	2,970 (100% Forest Service)	0.6	4.5	6	
Middle Fork Clearwater Face* *Forest Plan #170603040099*	25,100 (9,750 in HUC) (37% Forest Service)	8.9	2.1	13	
Unnamed No. 8 *Forest Plan #170603040008*	870 (100% Forest Service)	0.0	1.2	0	
Goddard Creek-Selway River** *6th field HUC #170603020405*	22,725 (95% Forest Service)	8.6	1.9	33	19.8
Elk City Creek *Forest Plan #170603020123*	1,800 (97% Forest Service)	0.3	2.6	3	
Goddard Creek *Forest Plan #170603020122*	9,250 (100% Forest Service)	0.7	1.7	7	
Lower Selway River* *Forest Plan #170603020125*	12,000 (4,720 in HUC) (89% Forest Service)	6.7	1.5	15	
Swiftwater Creek *Forest Plan #170603020124*	3,925 (97% Forest Service)	0.6	2.9	4	
O'Hara Creek** *6th field HUC #170603020404*	37,900 (100% Forest Service)	12.6	1.4	82	3.1
Lower O'Hara Creek *Forest Plan #170603020121*	9,610 (100% Forest Service)	4.8	1.2	20	

*Prescription Watershed (Forest Plan Subwatersheds) extends into additional 6th Level HUC.
** 6th Level HUC may have other Forest Plan Prescription Watersheds that are not displayed as they are outside of the project's scope.
†ECA: Equivalent Clearcut Area

Watershed conditions in the Johnson Bar Fire Salvage project area are a result of both natural processes and human activities. Past human-related activities include recreation, fire suppression, road building and maintenance, and previous harvest activities (1950s to 2014). Past harvest and associated road construction have likely had the most impact to water and sediment yields.

The Johnson Bar fire is the most recent, large-scale disturbance in the hydrologic analysis area. This report uses burn severity to describe potential watershed effects of the Johnson Bar fire, and potential interactions with treatments in the Johnson Bar Fire Salvage project. Burn severity describes the effects of the fire on soil structure, infiltration capacity, and biotic components, and is used to indicate runoff and soil erosion potential from the fire. Burn severity maps were produced and field-verified as part of the BAER assessment for the Johnson Bar fire (USDA, 2014). Burn severity is defined through differences in surface organics, duff cover, and characteristics of mineral soils (Debano *et al*, 1998):

- Low severity – low soil heating, litter scorch or consumption with duff largely intact, mineral soil is not changed.
- Moderate severity – litter consumption with moderately charred or consumed duff, no visible alteration of mineral soil surface.
- High severity – complete consumption of duff and mineral soil surface visibly reddish or orange color.

Figure 5- Forest Plan Prescription Watersheds and major streams in the Johnson Bar Fire Salvage project Area

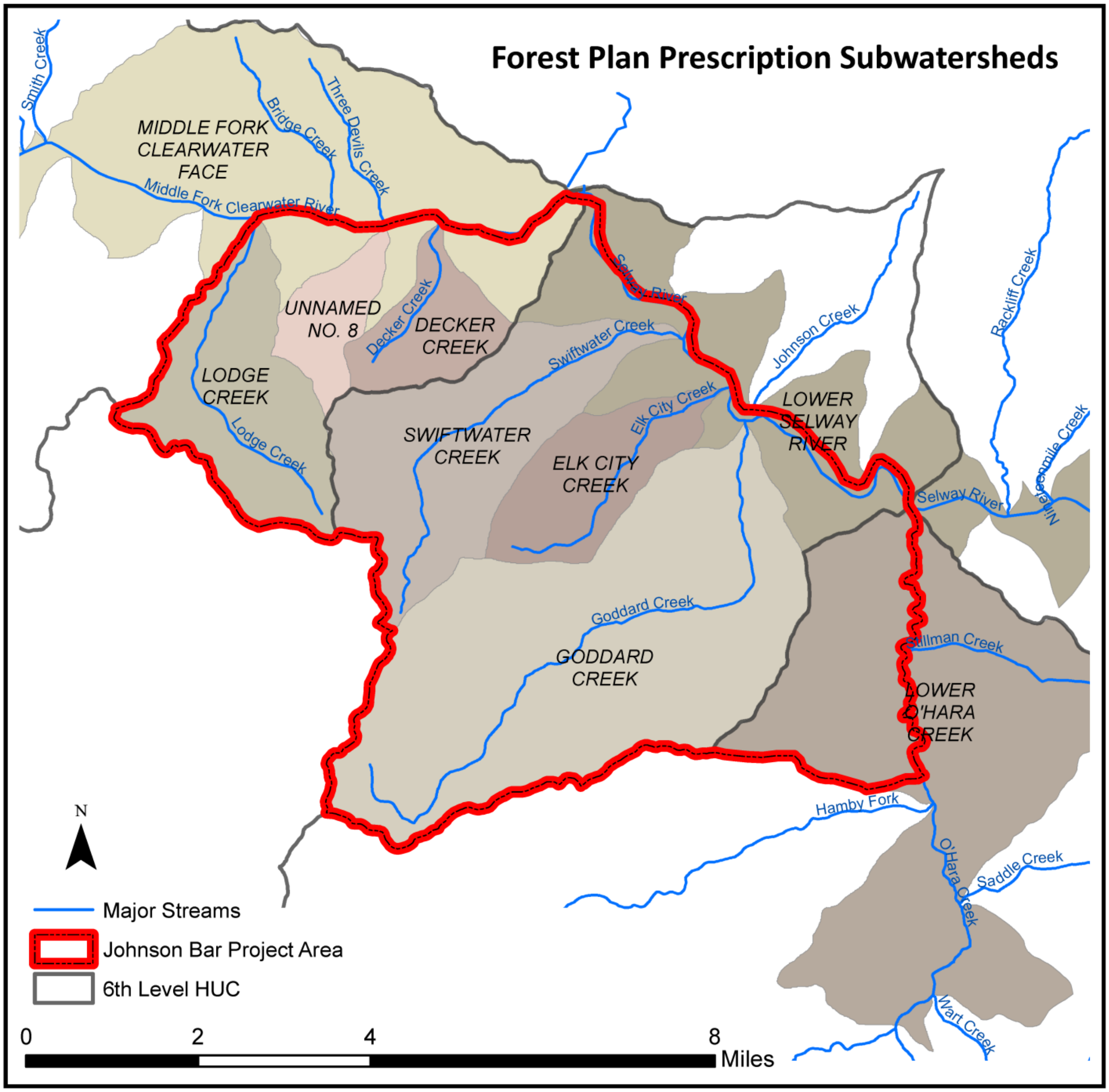
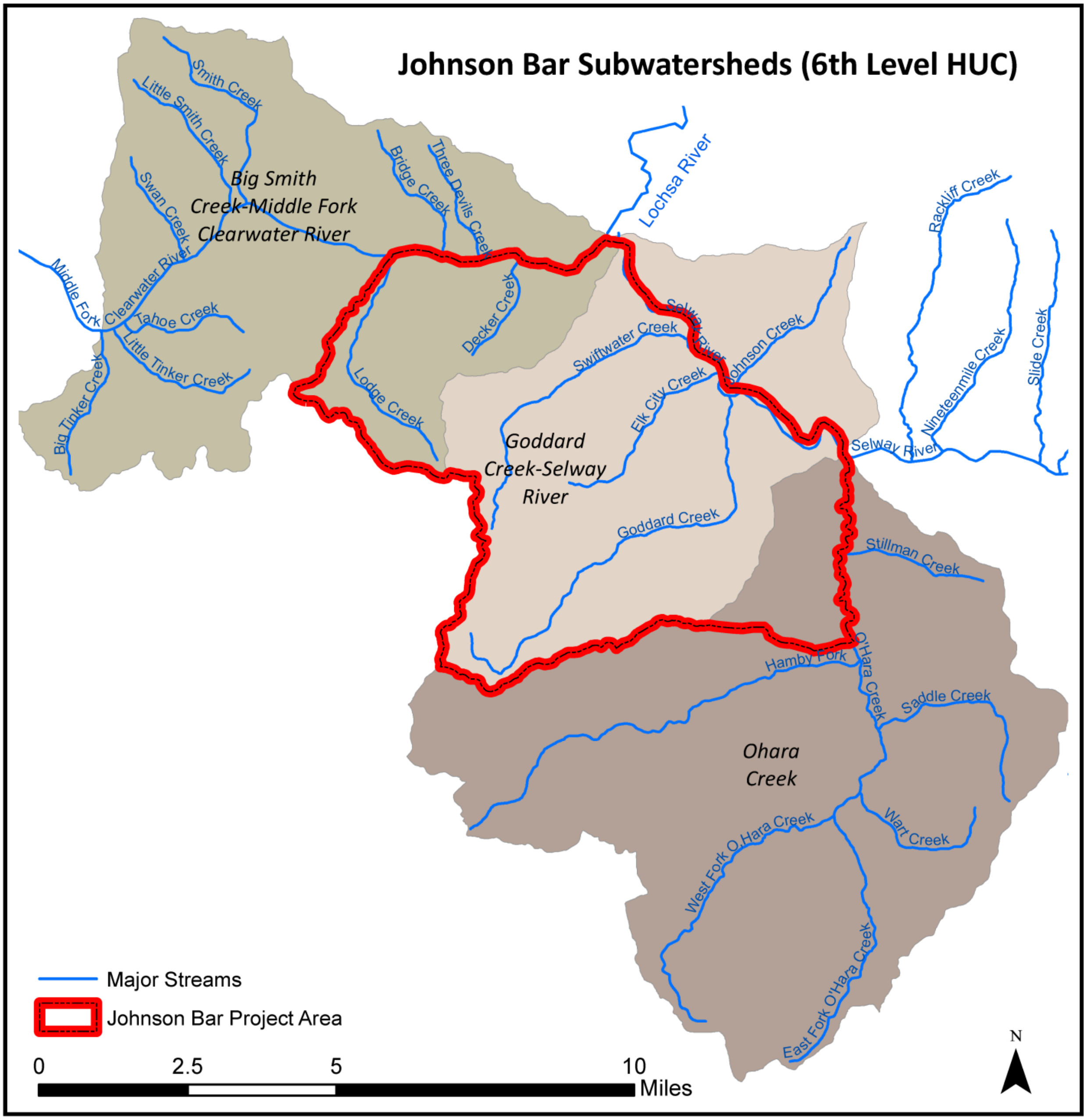


Figure 6 – Johnson Bar Fire Salvage project Area Subwatersheds



Water Yield: Water yield refers to the volume and timing of stream flow at a given point. In the absence of major disturbance, a stream channel is typically dynamically in balance with its flow regime, which is a key determinant of the energy available for erosion, transport, and deposition of sediment within channels. Increased water yields may be associated with increased probability of peak flow events, which could lead to increased channel and bank adjustment through scour, bedload movement, or redistribution of sediment in depositional areas.

Water yield can increase after loss of mature trees (e.g. through harvest or wildfire) due to a reduction in transpiration and precipitation interception losses. Removal of forest canopy can also affect snow accumulation and melt processes, often resulting in an increase in snowpack accumulation and melt rates, which can lead to altered timing of peak snowmelt runoff, depending on the size, orientation and total area of clearcuts in a given drainage (Storck et al. 2002, Winkler et al. 2005). There are no Nez Perce Forest Plan, State of Idaho, EPA or other National standards governing peak flow increases. The Forest Plan calls for maintaining the stability, equilibrium and function of all streams on the Forest.

Equivalent clearcut area (ECA) was used as an indicator of change in water yield resulting from reductions in live forest canopy (green tree harvest and related activities, such as road building). Lower ECA generally indicates a higher likelihood that stream channels are in balance with their flow regime. An ECA value of less than roughly 15 percent indicates favorable conditions in this regard. An ECA value of 15-30 percent indicates a moderate potential for a channel-flow regime imbalance. A value greater than 30 percent is considered low (poor) condition (NOAA 1998). Moreover, a statistically significant increase in stream flow is generally not measurable until at least 20 to 30% of a watershed's forest cover is removed (MacDonald and Stednick 2003).

Table 3-6: Estimated percent increase in ECA over baseline (zero disturbance) conditions.

Subwatershed (HUC6)	Existing ECA increase (%)
O'Hara Creek	3.1
Goddard Creek – Selway River	19.8
Big Smith Creek - Middle Fork Clearwater River	17.4

Sediment Yield: Active erosion of the landscape occurs naturally and due to human activities, and yields sediment to streams. When chronic or excessive sediment inputs occur, the stream's ability to route the sediment through the system is reduced and water quality and aquatic habitat can be diminished. Harvest and road-related activities have the potential to increase erosion production and sediment delivery into streams.

Prescription watersheds were assigned fishery/water quality objectives in Appendix A of the Forest Plan. These objectives provide management direction in terms of the maximum estimated increase in sediment over baseline conditions that can be approached or equaled for a specific number of years per decade. Seven of the nine Forest Plan prescription watersheds met their fish/water quality objectives. The remaining two watersheds did not have objectives designated, nor were sediment yield guidelines assigned. Lower O'Hara Creek, Goddard Creek and Lodge Creek prescription watersheds have an Upward Trend Requirement, which allows timber management to occur, concurrent with improvement efforts, as long as a positive upward trend in habitat carrying capacity in indicated. The sediment yield guidelines (the maximum sediment yield allowable to meet fish/water quality objectives) are shown for each watershed in Table 3-14.

In addition, entry frequency guidelines of 1 to 3 entries were also assigned in Forest Plan Appendix A. Few activities have occurred in any of the watersheds in the past 10 years to qualify as an entry, when considering sediment production. In 2014, about 5 acres of commercial thin took place from the Lodge Point sale on the ridge top between Lodge Creek and Swiftwater Creek. In the Lodge Creek drainage, there was a 479-acre helicopter salvage sale in 2005. Also in 2005, a 100-acre helicopter patch harvest occurred in Decker Creek. These entries combined with the proposed project would not exceed entry limits requirements for the drainages in question. Other harvest activities identified predate the decade timeframe for the entry frequency guidelines.

Areas adjacent to streams are the most likely to contribute to stream sedimentation. However, upland areas may be connected to the stream network via the road network, through intermittent channels or ephemeral draws. Burned areas are vulnerable to accelerated soil erosion which can increase post-fire sediment yield (Neary, et al., 2005). Increases in surface erosion following wildfire have been well documented (Helvey, 1980; Robichaud and Hungerford, 2000; Wondzell and King, 2003; and Neary et al., 2005). However, effects are spatially variable based on burn severity as well as timing and magnitude of precipitation (Robichaud and Hungerford, 2000).

Roads in the project area concentrate overland flow and are potential sources and vectors of sediment to streams. Roads increase the volume of flow during large storm events through overland flow from precipitation on compacted road surfaces as well as interception of subsurface flow in road cuts. Roads reduce vegetative cover in streamside areas and can accelerate erosion and sedimentation into streams (Megahan and Clayton, 1983). Slope position of roads is a critical factor in the interaction between roads and streams. Ridge-top roads are often disconnected from the stream channel network, but can influence watershed hydrology by channeling flow into small headwater swales, accelerating channel development. Mid-slope roads can intercept subsurface flow, extend channel networks, and accelerate erosion (Gucinski et al., 2001). Roads adjacent to and crossing streams, or otherwise hydraulically connected to streams, have the greatest influence on streamflow, and sediment delivery to the stream system.

Road densities in Forest Plan Prescription Watersheds range from 0.5 to 4.5 mi/mi^2. A watershed in high (good) condition generally has a road density of less than 1 mi/mi^2. Watersheds with 1 to 3 mi/mi^2 are rated as moderate and greater than 3 mi/mi^2 are rated as low (poor) condition (NOAA 1998). One of the Forest Plan prescription watersheds is rated as high, seven are rated as moderate condition and one is rated as low condition (Table 3-5).

3.4.6 Direct and Indirect Effects

The direct and indirect effects area consists of the nine Forest Plan Prescription watersheds in which the proposed project activities would occur (Table 3-5).

3.4.6.1 Alternative 1

Under this alternative, no proposed management actions would occur. Actions occurring on State and private lands would continue. Because no vegetation removal or new ground-disturbing activities would occur, there would be no direct effects from this alternative.

Indirectly, road density and road-related erosion would remain unchanged from existing conditions. Benefits from the reconditioning, reconstruction, and decommissioning of roads proposed in the action alternative would not be attained. The existing road network would continue to be a potential source of sediment, and unneeded roads would remain on the landscape, leaving these sites with impaired soil productivity and hydrologic function. Similarly, post-fire hillslope erosion risk would remain unchanged in the area burned in the Johnson Bar fire. Erosion-mitigating measures planned in the project would not occur.

Alternative 1 does not propose any new activities that would directly or indirectly affect wetlands or floodplains or increase stream temperatures.

3.4.6.2 Alternatives 2, 3, and 4

Water Yield

The effect of the project on water yield would be negligible in the short-term because proposed activities primarily would remove dead trees. Many of the fire-killed trees in the project area have retained their branches, and for the next few years would continue to intercept precipitation (albeit at a reduced rate), as well as provide some shade. However, their primary role in influencing stream water yield—transpiration—no longer occurs, and evaporation of precipitation is substantially curtailed and would further diminish with time as trees begin to fall. Areas where project activities could influence water yield are at the sites of new landings and temporary roads, the construction of which would likely result in the removal of small numbers of green trees. Five percent of the dead tree harvest acres were included in the ECA calculation in order to account for the potential incidental loss of a few green trees. Similarly, 50% of new temporary road and landing construction area was incorporated into the ECA to account for any green trees removed for these activities. The actual numbers of green trees removed in these activities are likely to be substantially lower. Regardless, these activities were estimated to have a negligible impact on water yield as indicated by the change in ECA (Table 3-7). The existing condition reflects the large area burned in the Johnson Bar fire, as well as other natural and human disturbance, including roads.

Table 3-7: Estimated percent increase in ECA over baseline (zero disturbance) conditions

Subwatershed (HUC6)	Existing ECA (%)	Project-related ECA increase (%)			Total ECA including project activities (%)		
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 2	Alternative 3	Alternative 4
O'Hara Creek	3.1	0.0	0.0	0.0	3.1	3.1	3.1
Goddard Creek – Selway River	19.8	0.5	0.0	0.1	20.3	19.8	19.9
Big Smith Creek - Middle Fork Clearwater River	17.4	0.2	0.0	0.0	17.6	17.4	17.4

Alternative 2 proposes 2,973 acres of salvage harvest. Alternative 3 proposes 2,580 acres of salvage harvest. Alternative 4 proposes 2,298 acres of salvage harvest. Harvest activities would occur on roughly one to 28 percent of the area in the watersheds (Table 3-8). Between <1% and 9% of total 6th-HUC drainage area would be harvested, depending on watershed and alternative. Depending on the alternative, salvage would occur on approximately 17-22% of the total area burned by the Johnson Bar Fire. As noted above, harvest activities would remove dead trees, which have only a minor effect on water yield.

Sediment Delivery to Streams—treatment units

The Johnson Bar fire left hillslope conditions conducive to elevated erosion and sediment transport to streams. With diminished or absent canopy, groundcover and litter layer, soils are more prone to erosion. Reduced surface complexity and hydrophobic soils cause reduced infiltration which can lead to enhanced runoff, carrying eroded sediment to stream channels. Under pre-fire conditions, many project-area ephemeral draws rarely if ever conveyed surface flow to headwater intermittent channels. Reduced infiltration and elevated runoff in the post-fire setting could result in these uppermost headwater drainage features providing ephemeral connectivity (and sediment transport) to stream channels. Compaction and rutting of burned soils by heavy equipment would exacerbate soil issues. Furthermore, removal of most trees from large patches (treatment units) could result in earlier snowmelt and altered timing of peak flow.

Project activities have the potential to influence erosion and sediment delivery to streams, positively or negatively. In the proposed project, removal and yarding of trees using mechanized equipment would likely temporarily expose mineral soil to erosion, and may create new (or exacerbate existing) vectors for sediment transport to stream channels. Project activities could expose sediment to overland flow in harvest areas, on skid trails, skyline corridors and landings, and at ditch crossings. Project resource protection measures would greatly reduce the probability that any eroded sediment would reach a stream channel or ephemeral draw. Project activities that could lead to a reduced sediment load to streams include erosion control (scattering of slash) on burned hillslopes, as well as road drainage improvements and road decommissioning.

Table 3-8: Area and percent of prescription watersheds with activities

Johnson Bar Project 6th HUC Watershed and Forest Plan Prescription Watersheds	Acres of proposed salvage harvest			Proposed temporary roads (acres)			Percent of total watersheds		
	Alt. 2	Alt. 3	Alt. 4	Alt. 2	Alt. 3	Alt. 4	Alt. 2	Alt. 3	Alt. 4
Big Smith Creek-Middle Fork Clearwater River	797	797	493	1.0	0.5	1.9	3%	3%	2%
DECKER CREEK	299	299	220	0.4	0.2	0.8	24%	24%	18%
LODGE CREEK	96	96	96	0.2	0.2	0.2	3%	3%	3%
MIDDLE FORK CLEARWATER FACE	247	247	81	0.1	0.1	0.6	1%	1%	0%
UNNAMED NO. 8	155	155	96	0.3	0.0	0.3	18%	18%	11%
Goddard Creek-Selway River	2055	1662	1683	4.8	0.5	4.8	9%	7%	7%
ELK CITY CREEK	501	363	407	1.1	0.4	1.1	28%	20%	23%
GODDARD CREEK	664	650	626	1.3	0.1	1.3	7%	7%	7%
LOWER SELWAY RIVER	408	306	273	0.2	0.0	0.2	3%	3%	2%
SWIFTWATER CREEK	482	343	377	2.2	0.0	2.2	12%	9%	10%
O'Hara Creek	122	122	122	122.0	122.0	122.0	<1%	<1%	<1%
LOWER O'HARA CREEK	122	122	122	0.5	0.0	0.5	1%	1%	1%

Proposed logging systems minimize the probability that project activities would result in elevated erosion and sediment delivery to streams. Tractor skidding of logs occurs on skid trails and swing trails, and is typically the harvest activity that has the greatest potential to cause soil erosion, as well as sediment delivery where connected or near to streams. Tractor units in this project are limited to ridgetop locations that are generally not connected to the drainage network, and are limited in slope (see soils report for further discussion). Four proposed tractor units (103, 105, 106 and 140) included headwater draws that would have required additional protection from erosion. Scattering of slash in these units following tree removal would reduce probability of erosion and sediment delivery over the existing post-fire condition. However, the burned draws themselves are particularly vulnerable to disturbance and have the potential to transport eroded sediment to the channel network Because of these concerns, the aforementioned units were either changed to skyline (105 and 106) or helicopter (140), or dropped from the project (103). Aside from these four units, the lack of connectivity to headwater draws combined with soil-protecting design features should result in no impact to water quality or riparian and aquatic habitat conditions from tractor skidding.

Helicopter and skyline harvest methods are low-impact approaches where trees are cut by individual fallers and rigged to cables which suspend the logs as they are hauled to landings either partially (skyline) or fully (helicopter). In helicopter units, ground disturbance is minimal (see soils report). In skyline units, linear soil disturbance would likely occur along the corridors where logs are hauled upslope to landings. Unmitigated, these corridors have the potential to concentrate overland flow given their typical linear arrangement on the fall line of the slope. Project skyline corridors would terminate at considerable distances from stream channels or ephemeral draws, leaving them unlikely to connect to streams. Nevertheless, probability of erosion and sediment delivery would be substantially reduced through various erosion control measures, for example by lining corridors with slash, and installing waterbars if needed during and following yarding operations in order to avoid development of preferential surface flowpaths.

Skyline corridors in several proposed units were evaluated using WEPP in order to estimate effectiveness of proposed erosion control design features. The results of this evaluation suggest that in the absence of erosion-control design features, disturbance in skyline corridors typical of the project would lead to greater erosion and downslope sediment transport than the existing condition (Table 3-9). While no skyline corridors terminate near perennial streams, they could deliver sediment to ephemeral draws, which are more likely to carry runoff in the post-fire setting. The erosion modeling suggests that placement of slash (95% ground cover) on skyline corridors would reduce the likelihood of corridor erosion and sediment transport below that of the existing (post-fire) condition (Table 3-10). Adding water bars at 100-foot intervals where bare soil is exposed would further reduce sediment transport. These conclusions apply to each action alternative.

Table 3-9: Estimated sediment delivery (10% probability) from representative skyline corridors

Unit	Length (feet)	Slope (%)	Burn severity	Existing condition (tons/acre)	Skyline corridor (tons/acre)			
					No BMPs	slash 95%	water-bars	slash + wbars
111	1300	46	moderate	6.8	13.7	0.3	1.4	0.0
114	1000	40	low	0.7	2.3	0.2	0.6	0.0
131	700	47	low to moderate	0.8	2.2	0.1	0.7	0.1

As stated above, hand crews falling trees in treatment units is not predicted to measurably influence post-fire erosion or runoff. Nonetheless, the project presents an opportunity to reduce hillslope erosion below the existing conditions present in many of the treatment units. The project would require scattering of fine woody debris (slash) to achieve an 85% surface cover (approximately 5-10 tons per acre) on treatment unit hillslopes burned at moderate to high severity. In addition to the fine woody debris, coarse (greater than three-inch diameter) woody debris would be retained at the rate of 17-33 tons/acre in all units, regardless of burn severity. The fine woody debris requirement specifically addresses erosion concerns. While the coarse wood requirement addresses soil biological function, it too would help to reduce erosion and sediment transport. The ERMiT interface of WEPP was used to estimate the effect of retaining fine slash on treatment units (Table3-10). The model estimates that this treatment would reduce hillslope erosion by roughly 48 percent on average from existing conditions post-fire (range 37-63%) in treatment units for Alternative 2. Reduction in erosion would be similar in all of the action alternatives. The sediment values shown in Table 3-10 are based on the 10% probability runoff event in the second year after the fire, when the project would likely be implemented. For higher-probability (more frequent) runoff events, the predicted sediment load would be lower under both existing and post-project conditions.

The reduction in erosion and runoff from the treated areas would reduce the potential magnitude of a post-fire sediment runoff event wherever the treatments occur. Moreover, fine slash would begin to accumulate immediately as dead trees are cut and limbed on site. Thus, the erosion-mitigating aspects of the treatment would occur as work in the unit progressed, rather than only at the end of activities.

Table 3-10: Model estimates of existing and post-treatment erosion, 10%-probability runoff event (Alternative 2)

Forest Plan Watershed	Existing (post-fire) (tons)	Post-treatment (tons)	Project reduction (%)
DECKER CREEK	196	102	48%
ELK CITY CREEK	315	178	44%
GODDARD CREEK	401	203	49%
LODGE CREEK	27	10	63%
LOWER O'HARA CREEK	61	29	52%
LOWER SELWAY RIVER	48	28	41%
MIDDLE FORK CLEARWATER FACE	72	24	67%
SWIFTWATER CREEK	190	108	43%
UNNAMED NO. 8	35	22	37%
TOTAL	1,345	704	48%

Sediment Delivery to Streams—roads

Haul roads can be a source of sediment to project area streams, particularly where there are existing sediment delivery points (roadside ditches leading to stream channels). Increased heavy-truck traffic related to log hauling can increase rutting and displacement of road-bed material, creating conditions conducive to higher sediment delivery rates (Reid and Dunne, 1984).

Approximately 68 miles of road work is proposed and would include spot application of aggregate, and drainage improvement, including reshaping of road surface as well as cross-drain reconnection, repair, clearing, and new installation, as needed. Application of road maintenance and hauling resource protection measures (e.g. blading/compaction, drainage improvement, aggregate surfacing) can substantially reduce erosion and sediment transport along haul routes (Burroughs 1990, Grace and Clinton 2006, Switalski *et al*. 2004, Swift and Burns 1999, Ice *et al*. 2004, Montana DNRC 2012). For example, well-designed and maintained road surface drainage, in conjunction with a properly graded road surface, should divert most road-surface runoff to undisturbed forest floor, where conditions allow for sediment deposition and infiltration (Burroughs and King 1989, Foltz and Burroughs 1990, Montana DNRC 2012). At stream crossings and other areas where proper road drainage cannot prevent overland flow to a stream, gravel surfacing using high-quality aggregate would minimize sediment transport and delivery (Kochenderfer and Helvey 1987, Burroughs and King 1989, Sugden and Woods 2007). Additionally, properly applied log-hauling BMPs should limit any increase in sediment delivery from roads.

The proposed project would require that all log-haul roads with surveyed sediment-delivery points be improved to reduce delivery prior to commencement of tree removal and hauling. Sediment delivery points were modeled using the WEPP Roads module (Elliot, 2000) in order to estimate existing conditions as well as potential reductions in sediment delivery resulting from project road improvements. Results indicate that project road work would result in a decrease in sediment delivery of roughly 77% on an annual average basis (Table 3-11). The model evaluated existing (often rutted, gravel or native surface with inadequate drainage) conditions and post-improvement (unrutted with improved drainage) conditions. While proposed road BMPs would reduce sediment delivery from project roads during project activities and into the future, blading of native-surface roads temporarily exposes higher levels of sediment to erosion and transport (Sugden and Woods, 2007). Compaction of freshly bladed surfaces prior to rainfall, whether by a roller or by traffic, reduces this temporary road surface susceptibility to erosion.

Table 3-11: Estimated sediment delivery by haul-route road before and after project improvement work, all action alternatives

Drainage (6th-HUC)	Sediment delivery (tons/year)	
	Existing	Project
Goddard Creek-Selway River	4.2	0.4
O'Hara Creek	0.1	0.1
Big Smith Creek-M.F. Clearwater River	1.9	0.9
TOTAL	6.2	1.4

Approximately 3.9 miles of temporary roads would be constructed to access harvest units for Alternative 2, 0.8 mile of which occur on existing templates. Alternative 3 proposes 0.7 mile of temporary roads, of which 0.5 mile are located on existing templates. Alternative 4 proposes 4.5 miles of temporary roads, of which 0.8 mile are located on existing templates.

The proposed temporary roads generally would be located on low gradient ridges or upper slopes and would not connect to ephemeral draws or stream channels. However, several proposed temporary road alignments appear to be on steeper slopes—up to roughly 20%. These slopes were not verified in the field, but could present surface-drainage challenges. Implementation efforts must pay careful attention to road drainage while these roads are in place—particularly on road 114A, which parallels an ephemeral draw. The road template for this segment already exists, is at least 300 feet from the draw, and is in unburned to low-severity burned ground.

Most of the proposed temporary roads are in patchy, generally low severity burn areas. Thus, any runoff from these roads would drain to forest floors where infiltration and deposition of any sediment load would occur. Given their location, and assuming proper drainage features are installed and maintained, the roads would be unlikely to contribute sediment to project-area streams. Temporary roads would be closed to public motorized use during project activities, reducing the chance of increased erosion produced when vehicles drive on wet roads and rut surfaces. Finally, all temporary roads would be obliterated following timber harvest activities, which would eliminate erosion potential in the future.

Depending on the alternative, one to five swing trails are proposed (1.1 miles for Alternatives 2 and 4, 0.2 mile for Alternative 3). A swing trail is a ridgetop skid trail upon which logs are skidded from a skyline site to a haul road. The proposed swing trails would be located on ridge crests, disconnected from stream channels or ephemeral draws, and thus are not expected to contribute sediment to streams. Three of the proposed swing trails would be located on unburned terrain, whereas the three others would be located on ridges with low to moderate-severity burn effects. Skid trails would be properly managed while in use to minimize disturbance and compaction, and decompacted and stabilized as described in the project design features.

Road erosion and sediment yield usually decline over time, but frequently continue at a chronic level indefinitely (USDA, 1981). Approximately 21.4 miles of road are proposed for decommissioning with this project under each action alternative. Road removal would reduce road density (Table 3-12) and provide an improvement in the overall watershed condition. Road density would be reduced due project road decommissioning in five of nine forest plan prescription watersheds. Moreover, several roads to be decommissioned are within RHCAs and cross streams.

Table 3-12: Estimated reduction in road density from project activities, all action alternatives

Forest Plan Prescription Watershed	Existing Road Density (mi/mi^2)	Proposed road decommissioning (mi)	Road density after project activities (mi/mi^2)
DECKER CREEK	0.5	0.0	0.5
ELK CITY CREEK	2.6	4.4	1.0
GODDARD CREEK	1.7	4.4	1.4
LODGE CREEK	4.5	1.9	4.1
LOWER O'HARA CREEK	1.6	5.7	1.2
LOWER SELWAY RIVER	1.5	1.4	1.5
MIDDLE FORK CLEARWATER FACE	2.1	0.1	2.1
SWIFTWATER CREEK	2.9	3.5	2.4
UNNAMED NO. 8	1.2	0.0	1.2

High (good) road density rating < 1 mi/mi^2; Moderate 1 to 3 mi/mi^2; and Low (poor) >3 mi/mi^2 (NOAA 1998)

Road decommissioning activities would benefit water resources by reducing interception of subsurface flow and surface runoff. Where decommissioned roads were hydraulically connected to stream channels, sediment delivery would be reduced or eliminated. Implementation of the proposed road decommissioning projects would remove stream culverts, which would improve streambank stability, width to depth ratio, and floodplain connectivity at these localized sites.

During road decommissioning, short-term, localized sediment delivery is possible where channels bisect decommissioned roads (Foltz *et al*., 2007). Past monitoring of obliteration showed only minor amounts of sediment delivered to headwater streams, mostly in the form of suspended sediment, as indicated by increases in turbidity. Design criteria and BMPs would be applied to each of these activities to minimize increases of sediment delivery to stream channels.

The NEZSED model was used to compare existing watershed sediment yield coarse estimates with estimates of potential sediment yield increase as a result of the proposed activities under the action alternatives. All alternatives for each of the prescription watersheds would remain below the sediment yield guidelines allowable under the Forest Plan Appendix A (Table 3-13). The greatest increase in sediment in the prescription watersheds was estimated to be a result of the Johnson Bar fire.

Implementation of project design measures, adherence to best management practices, and maintenance of PACFISH buffers would reduce potential erosion and further limit the risk of sediment reaching streams. Any sediment yield increases would be short-term (0-5 years) and beneficial uses in Selway River and the Middle Fork Clearwater River would be maintained.

Other Potential Water Quality Impacts

Project activities are not likely to measurably influence stream temperatures. The project would not remove trees within RHCAs, and thus would have minimal impact on stream shading in the project area. The Fisheries section discusses stream temperature in more detail.

Table 3-13: Estimated sediment yield (percentage over baseline)—NEZSED output

Prescription Watershed Name	year 1					Year 10
	Pre-fire	including Johnson Bar fire				Alternatives 2, 3, and 4
		existing	Alternative 2	Alternative 3	Alternative 4	
LOWER O'HARA CREEK	1%	2%	2%	2%	2%	1%
GODDARD CREEK	1%	7%	8%	8%	8%	0%
ELK CITY CREEK	1%	16%	21%	20%	20%	0%
SWIFTWATER CREEK	1%	9%	12%	10%	11%	1%
LOWER SELWAY RIVER	0%	2%	2%	2%	2%	0%
LODGE CREEK	1%	4%	5%	5%	5%	1%
UNNAMED NO. 8	1%	8%	11%	11%	10%	0%
DECKER CREEK	0%	7%	11%	10%	10%	0%
MIDDLE FORK CLEARWATER FACE	0%	0%	1%	1%	0%	0%

No activities, other than road work, are proposed in floodplains or wetlands. Although wetlands were not identified in the treatment units, small wet areas could exist in treatment units, especially in ephemeral draws. During project layout, potential wetlands would be identified and buffered.

3.5 Fisheries

3.5.1 Analysis Area

The proposed project area is approximately 26,800 acres in size and is located within the Lower Selway (HUC 4, 17060302) and Middle Fork Clearwater Sub-basin (HUC4, 17060304). The fisheries analysis area consisted of the potentially affected sub-watersheds (Table 3-1) because effects, including cumulative, would not necessarily be distinguishable at the larger scale. Sub-watersheds located within the greater Middle Fork Clearwater and Gedney Creek-Selway Watershed include O'Hara Creek, Goddard-Selway Creek, and Big Smith Creek-Middle Fork Clearwater sub-watersheds. The Nez Perce National Forest Plan (1987) further broke these sub-watersheds into smaller prescription watersheds with management areas being stratified by specific fishery/water quality objectives (Table 3-14). Some of the prescription watersheds are considered to be functioning below objectives and excess sediment in a few of these streams is a primary limiting factor; therefore, management within these prescription watersheds is contingent upon showing an improving trend (refer to Appendix D for a complete Upward Trend analysis).

Table 3-14: Subwatersheds analyzed in the proposed Johnson Bar Fire Salvage project Area

Watershed (HUC 5)	Subwatershed (HUC 6)	Prescription [1] Watershed (acres in project area)	Total Area of Subwatersheds (Acres)	Project Area in Subwatershed (Acres)
MF Clearwater (1706030400)	Big Smith Creek-MF Clearwater River	Lodge Creek [2]	28,875	6,513
		Unnamed No. 8		
		Middle Fork Clearwater Face		
		Decker Creek		
Gedney- Selway (1706030201)	Goddard Creek-Selway River	Goddard Creek [2]	22,725	17,410
		Swiftwater Creek [2]		
		Elk City Creek		
		Lower Selway River		
	O'Hara Creek	Lower O'Hara Creek [2]	37,900	2,864

[1]Subwatershed within the project area boundary with minimal acreage that would not be analyzed further: Pine Knob (6 acres), Unnamed No. 6 (3 acres), Johnson Creek (2 acres), Brown Springs Creek (17 acres), Clear Creek (9 acres) and Hamby Creek (20 acres).
[2]Streams within the prescription watershed with sediment as a primary limiting factor where management is contingent upon an improving trend. *"Timber management can occur in these watersheds, concurrent with improvement efforts, as long as a positive, upward trend in habitat carrying capacity is indicated."*

3.5.2 Regulatory Framework

The Nez Perce National Forest Plan direction and all Federal and State laws and regulations applicable to watershed and fishery resources would be applied to the proposed project, including the Clean Water Act, Endangered Species Act, and the Magnuson-Stevens Act.

3.5.2.1 Nez Perce National Forest Plan

Forest-wide standards for aquatics can be found within the Nez Perce National Forest Plan (USDA Forest Service 1987a, pages II-18 through 11-20). The Forest Plan directs forest management activities in order to minimize sediment input to streams, meet beneficial uses, apply BMPs to ensure water quality standards are met or exceeded, and manage all water in accordance with the designated standards located in the Forest Plan Appendix A. This project would comply with these directions through the implementation of design criteria and road improvement and decommissioning activities.

Amendment 20 (PACFISH) amended the Nez Perce Forest Plan in 1995 (PACFISH; USDA Forest Service 1995b). PACFISH established riparian goals and riparian management objectives (RMOs) and defined riparian habitat conservation areas (RHCAs). PACFISH includes specific direction for land management activities within riparian areas adjacent to streams, lakes, wetlands, and landslide prone terrain, and also directs the Forest to maintain or improve habitat elements, such as water quality, stream channel integrity, instream flows, and riparian vegetation. The proposed project would be in compliance with PACFISH and would contribute to the attainment of RMOs.

3.5.2.2 Endangered Species Act

The Endangered Species Act (ESA) is implemented by the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. The ESA provides a framework for the conservation of threatened and endangered plants and animals and their respective habitats. Bull trout, steelhead trout, and fall chinook salmon are listed as threatened under the ESA. Consultation is required with the USFWS and NOAA for any projects potentially affecting these species. Design criteria would be utilized to prevent any long-term adverse effects to listed species.

3.5.2.3 Sensitive Species

Sensitive species are those that show evidence of a current or predicted downward trend in population number or habitat suitability that would substantially reduce species distribution. Federal laws and direction applicable to sensitive species (SS) include the NFMA and FSM 2670. The Forest is required to determine the potential effect of proposed activities on SS and to prepare biological evaluations. The Forest Service is bound by federal statutes (ESA and NFMA), regulations, and agency policy (FSM 2670) to conserve biological diversity on NFS lands and to assure SS populations do not decline or trend toward a listing under the ESA. The Regional Forester Sensitive Species List was updated for the Forest February 2011. The list includes the westslope cutthroat trout, interior redband trout, spring Chinook salmon, Pacific lamprey and the western pearlshell mussel.

3.5.2.4 Magnuson-Stevens Act

The Magnuson-Stevens Act (MSA) requires an analysis for effects to Essential Fish Habitat (EFH), specifically for Pacific salmon. EFH includes all streams, lakes, ponds, wetlands, other currently viable water bodies, and most of the historically accessible habitat to Pacific salmon species, including the riparian zone adjacent to these waterways. The riparian zone consists of the shade, sediment, nutrient/chemical regulation, streambank stability, and large woody debris/organic matter. EFH is located along the Middle Fork Clearwater and Selway Rivers and the O’Hara Creek.

3.5.3 Analysis Methodology

The environmental baseline and effects discussion used Forest Service habitat stream survey data, Idaho Fish and Game (IDFG), PACFISH/INFISH Biological Opinion (PIBO), and Nez Perce Tribe (NPT) stream survey data, as well as geographic information systems (GIS) analysis. GIS applications included the Terrain Works (NetMap) Steelhead Intrinsic Potential model. Water temperature data was referenced from the Nez Perce-Clearwater (NPCLW) National Forest monitoring records. The seven-day moving maximum and average summer time water temperatures were measured. Stream surveys followed the Region 1 and Region 4 stream survey protocol (following a modified Hankin and Reeves 1988 protocol).

The three major components to the Johnson Bar Salvage Project are commercial harvest (primarily skyline and helicopter), landing and road development, and subsequent road decommissioning efforts. Each of these activities carries potential for effects to some component of aquatic habitat. Water quality, habitat quality, and the ability of the watershed and riparian areas to act as a buffer to harvest activity and its connected actions are components considered in this analysis. Pool frequency and quality, large woody debris (LWD), cobble embeddedness/percent fines, and water temperature are habitat components or indicators that are potentially affected by timber activities and considered in this analysis. These habitat parameters are specifically addressed as PACFISH Riparian Management Objectives (RMOs) (referencing Section 7 Fish Habitat Monitoring Protocol for the Upper Columbia River Basin, USDA Forest Service, 1994), and are summarized in Table 3-17. These objectives are part of determining the complexity of habitat available for fish within the analysis area.

Table 3-15: Rationale for including aquatic habitat components in the Johnson Bar Effects Analysis

Habitat Component	PACFISH RMO	Habitat Could Potentially be Affected by:		
		Timber Harvest	Road and Landing Construction	Road Improvements/Decommissioning
Water quality				
Temperature	X	X	X	X
Suspended sediment		X	X	X
Chemical contamination		X	X	X
Large woody debris	X	X		
Stream Channel conditions				
Substrate		X	X	X
Pool frequency/quality (tied to sediment inputs)	X	X	X	X
Flow regime				
Flow timing		X		
Flow volume		X		
RHCA Condition				
Road density and location	Not a habitat parameter. Included because it could affect habitat quality			
Disturbance history regime	Not a habitat parameter. Included because it could affect habitat quality			

Table 3-16: PACFISH RMOs (NPNF and LRMP as amended by PACFISH, 1995)

<table>
<tr><th>Habitat Feature</th><th>RMOs</th></tr>
<tr><td>Pool Frquency[1]</td><td><table><tr><td>Wetted width (ft)</td><td>10</td><td>15</td><td>20</td><td>25</td><td>50</td><td>75</td><td>>75</td></tr><tr><td>Number pools/mile</td><td>96</td><td>70</td><td>56</td><td>47</td><td>26</td><td>23</td><td>18</td></tr></table></td></tr>
<tr><td>Water Temperature</td><td>Compliance with Water Quality standard or maximum Temp. <64 ºF for migration and rearing and <60°F for spawning.</td></tr>
<tr><td>Large Woody Debris</td><td>> 20 pieces/mile, >12 inch diameter, >35 ft. length</td></tr>
</table>

[1] Local adaptation of Making Endangered Species Act Determinations of Effects for Individual or Grouped Actions at the Watershed scale, National Marine Fisheries Service, Environmental and Technical Services Division, Habitat Conservation Branch, August 1996.

Under the Section 7 Habitat Monitoring Protocol for the Upper Columbia River Basin (USDA 1994), PACFISH RMOs are intended to apply to Rosgen (1996) C-type channels. For example, monitoring protocol for determining pool frequency requires count of only pools greater than 1 meter (~3 feet) in low gradient (1% -2%) stream channels. Few stream reaches in the analysis area fit these criteria; many stream reaches in the project area and analysis are not located in wide, low gradient, alluvial valley floors. Instead, the majority of stream reaches within these subwatersheds are of mid-elevation and of moderate to high gradient.

Additional habitat parameters that are important for determining complex aquatic habitat and considered in this analysis include habitat accessibility, off channel habitat and refugia, floodplain connectivity, road density and location (measured as mi/mi^2 and percent drainage network increase), and past disturbance to riparian conservation areas.

In addition to stream surveys, Wolman pebble counts and cobble embeddedness surveys were conducted in riffles and were intended to characterize substrate composition and percent fines throughout the bankful streambed. Estimates of existing cobble embeddedness combined with NEZSED outputs for peak sediment yield were used to predict changes in summer and winter rearing carrying capacities for trout, salmon, and used in the FISHSED model (Stowell et al. 1983). The FISHSED model assumes there is an inverse relationship between the amount of fine sediment in spawning and rearing habitats and fish survival and abundance. In general, when sediment yields are increased over natural rates, especially on a sustained basis, fish biomass decreases (Stowell *et al*.1983).

Stream survey data were compared to objectives defined in Espinosa (1992) to determine if streams met their fish/water quality objectives as described in Appendix A of the Nez Perce Forest Plan.

3.5.4 Resource Indicators

Indicators for deposited sediment include the following:

- Changes in cobble embeddedness (as modeled by FISHSED)
- Changes in summer rearing capacity (as modeled by FISHSED)
- Changes in winter rearing capacity (as modeled by FISHSED)

Stream survey data were compared to objectives defined in Espinosa (1992) to determine if streams met their fish/water quality objectives as described in Appendix A of the NP Forest Plan. A one-way analysis of variance (ANOVA, Excel) with a Bonferonni adjustment was used to detect significant differences in mean weighted cobble embeddedness.

3.5.5 Affected Environment

The Middle Fork Clearwater and Selway subbasins are known to support resident and fluvial bull trout populations. Reaches within the proposed project area are limited to migration corridors and overwintering habitat; rearing and spawning is precluded due to high summer/fall water temperatures. The Selway is a core recovery area identified in the Draft Bull Trout Recovery Plan (USFWS 2014) with 10 local populations. See the Biological Assessment (BA) for a full description of Selway River summer Steelhead, fall Chinook, and bull trout populations within the Middle Fork Clearwater and Selway subbasin. Additional fish species that can be found in the mainstem Middle Fork Clearwater and Selway Rivers include: redsided shiner (*Richardsonius balteatus),* speckled dace (*Rhinichthys osculus),* longnose dace (*Rhinichthys cataractae*), sculpin (*Cottus spp.),* suckers (*Catostomidae spp*.), mountain whitefish (*Prosopium wouldiamsoni*), and the non-native smallmouth bass. No known populations of isolated rainbow/interior redband trout exists in the area. The Nez Perce Tribe is actively restoring Pacific lamprey populations to the Clearwater basin. The mainstem of the Middle Fork Clearwater and Selway Rivers provide migration, rearing, and spawning habitat for the Pacific Lamprey.

Due to the small and steep nature of the Middle Fork Clearwater Face drainages, streams such as Lodge and Decker Creek only seasonally support juvenile steelhead (Selway River Steelhead Recovery Plan NMFS 2011), fall/spring Chinook salmon, and Westslope cutthroat trout (WCT). These lower reaches provide rearing habitat for juvenile salmonids during the spring and summer months; salmonids seek refuge in small tributaries to escape high spring flows and cold base flows during the summer months. With the exception of portions of Swiftwater, O'Hara, and Goddard creeks, many tributaries in the Goddard-Selway watershed are very small and steep, limiting fish distribution to lower reaches of streams or excluding fish distribution entirely. Steelhead distribution is limited to ¼ length of Swifwater Creek with WCT distribution up to the upper ¾ of the stream. Steep gradients (Rosgen A channel type) and marginal overwintering habitat limit anadromous fish distribution. Steelhead trout have only been detected in the lower portions of Swiftwater and Elk City creeks. Goddard Creek supports juvenile salmonids throughout most of its length with limited habitat in its upper reaches (Rosgen A channel type, gradient > 6-10%). O'Hara Creek is designated critical bull trout habitat but, there have been few observations of bull trout (Selway BA USFS 1999 and Appendix A), and summer stream temperatures do not provide adequate rearing habitat for bull trout (Appendix B). O'Hara like, the mainstem Selway and

Middle Fork Clearwater Rivers are assumed migratory and overwintering habitat for bull trout only.

Steelhead, WCT, and Chinook are distributed throughout O'Hara Creek, but densities are less in these tributaries as compared to tributaries in the upper Selway subbasin (Meadow, Gedney, Bear and Moose creeks). Juvenile steelhead densities have decreased since 1988 surveys with variable density numbers, indicated by a Forest Plan Monitoring Site (Appendix A). While steelhead densities have decreased since the 1988 survey, Chinook and WCT densities have slightly increased. Selway River Steelhead are part of the Clearwater River Major Population Group (MPG). The Selway populations are part of the Clearwater MPG and of intermediate size; population viability is ranked at high risk and of low spatial structure (Selway River Steelhead Recovery Plan NMFS 2011). Fall Chinook adult returns and fish densities have dramatically increased due to supplementation efforts (Arnsberg and Kellar 2013). Fall Chinook spawn in the lower reaches of the Selway River and throughout the Middle Fork Clearwater River (Appendix A).

Table 3-17: Miles of Designated and Occupied Steelhead and Bull Trout Critical Habitat (DCH) and Chinook Essential Fish Habitat (EFH) within the Johnson Bar Fire Salvage project Area by Subwatershed

SWS (HUC 6)	Total Stream Miles	Steelhead DCH [1] (miles)		Bulltrout DCH (miles)		Fall Chinook and Spring/Fall Chinook EFH	
		Designated	Occupied (Spawning and Rearing)	Designated	Occupied (FMO)[2]	Designated	Occupied (Spawning and Rearing)
Big Smith Creek-MF Clearwater	16	0.5	1.4	0.5	0.5	0.5	1.0
Goddard Creek-Selway River	55	14.9	16.8	6.5	6.5	6.5	6.5
O'Hara Creek	11	2.80	2.80	2.80	2.80	2.80	2.80

[1]See Appendix A for steelhead and Chinook redd count data and fish densities
[2]Stream miles provide bull trout feeding, migratory, overwintering only

Map 7: Fish Distribution within the Johnson Bar Fire Salvage project Area

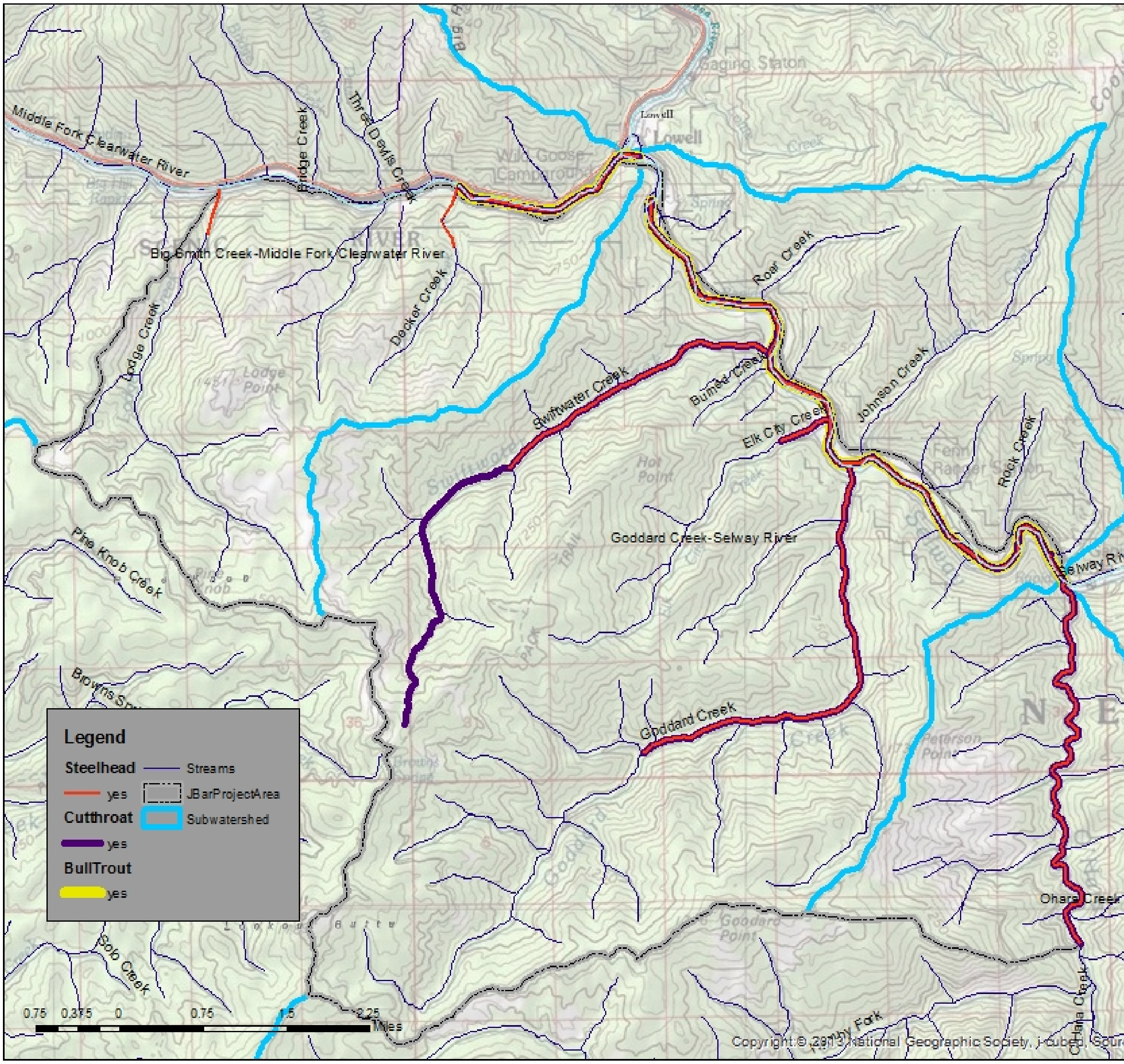
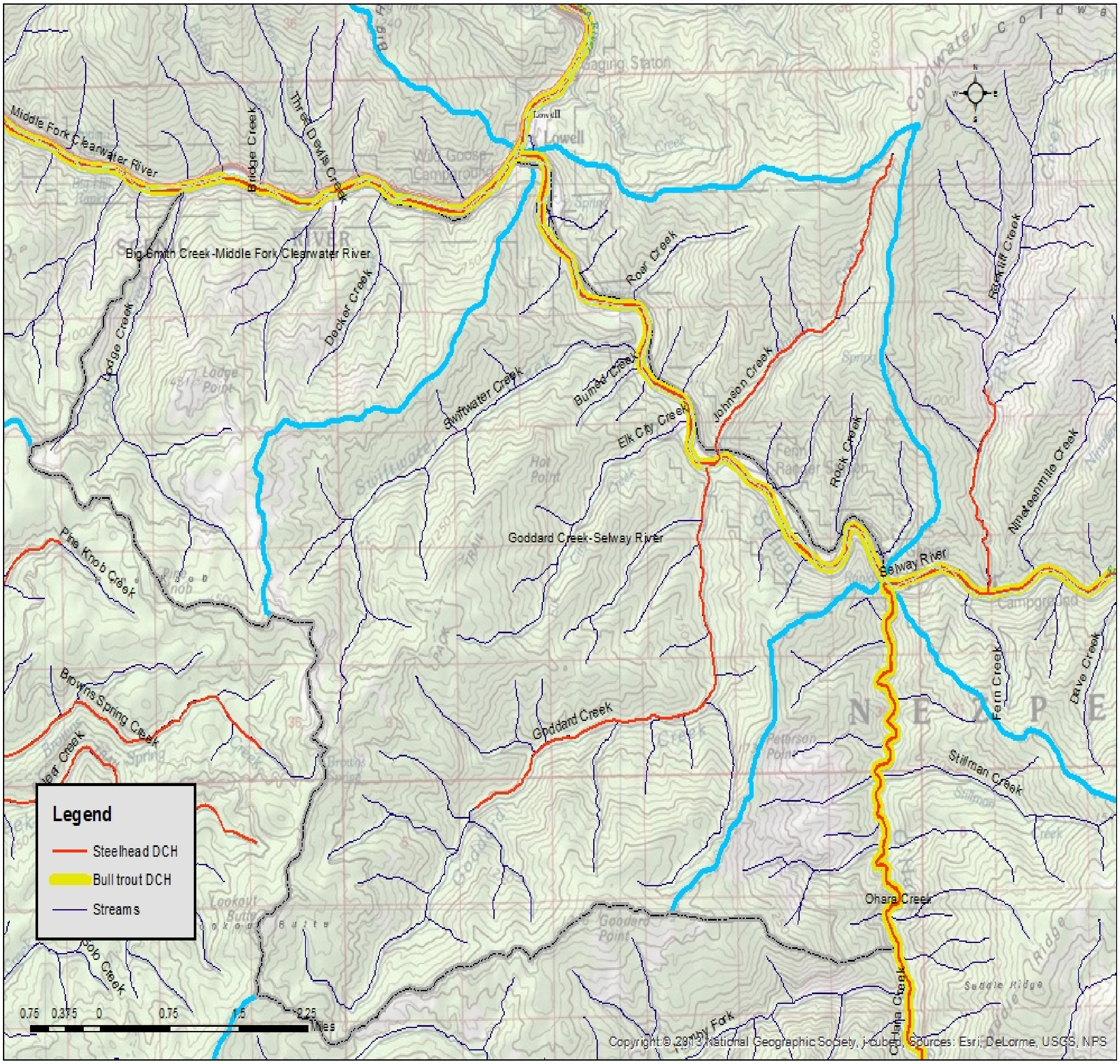


Figure 8: ESA Designated Critical Habitat within the Johnson Bar Fire Salvage project Area



3.5.6 Existing Condition

Elevations within the Middle Fork Clearwater watersheds range from approximately 1,300 – 5,000 feet and average 25-45 inches per year with the majority of it falling during the fall, winter, and spring months. Geology of the watersheds consists of moderately-weathered gneiss, schist and quartzites. The dominant landform in the area is steep stream breaklands with historic slump earthflow topography and debris torrents in channels. A higher occurance of debris torrents are associated with natural disturbances such as fire, rain-on-snow floods and human disturbance. Climatic events coupled with fire and past human disturbance have provided a relatively frequent supply of sediment form surface erosion, mass wasting and in-channel scour to stream systems within the project area. The majority of these tributaries are perennial with mean annual flows of 0.31 to 3.93 cubic feet per second (cfs).

The Selway River originates in the Bitterroot Mountains at an elevation of 9,110 feet and drops to 1,469 feet at its confluence with the Middle Fork Clearwater River. Maximum flows on the Selway are approximately 13,540 cfs and a low of 766 cfs with a mean annual flow of 3,765 cfs. Similar to the Middle Fork Clearwater face drainages, breaklands (schist) is the dominant landform in the lower Selway subbasin. Unstable soils and rain-on-snow events primarily during the spring/winter months cause frequent debris torrents. Vegetation community is similar to the Middle Fork Clearwater watersheds and was shaped by historic wildfires in the late 1800s to early 1900s. With a large portion of the Upper Selway designated Wilderness, the Selway subbasin supports intact accessible spawning and rearing, where the steelhead population has not been supplemented with hatchery fish. Of all the habitat components in the Selway River, mainstem river temperatures in the summer months is the most limiting habitat factor for rearing salmonids. Tributaries such as O'Hara, Goddard, Elk City, and Swiftwater creeks may be affected by excess levels of sediment deposited by natural events and human disturbance. There is however, a number of tributaries within the Selway subbasin that have quality habitat, with tributaries in roadless/wilderness areas that lack permanent sediment-producing features such as roads that are accessible and considered refugia for steelhead trout. Since many of these tributaries are prone to natural pulse sediment effects given unstable landtypes and climatic events, there are many tributaries that can function as refugia in the event that other streams are impacted by natural events as landslides, floods and fires.

3.5.6.1 Fish Distribution and Habitat

Table 3-18: Summary of ESA listed and Sensitive fish species and aquatic invertebrates including status located within the Analysis Area

Species		Threatened	R1 Sensitive	Forest MIS	ESA Critical Habitat (DCH)	Essential Fish Habitat (EFH)
Steelhead Snake River (SR)	*Oncorhynchus mykiss*	X		X	X	
Fall Chinook Snake River	*O. tshawyscha*	X			X	X
Bull trout Columbia River (CR)	*Salvelinus confluentus*	X			X	
Spring Chinook Salmon (SR)	*O. tshawyscha*		X	X		X
Interior redband trout	*O. mykiss gairdneri*		X			
Westslope cutthroat trout (WCT)	*O. clarki lewisi*		X	X		
Pacific Lamprey	*Lampetra tridentata*		X			
Western Pearlshell Mussel	*Margaritifera falcata*		X			

3.5.6.2 Baseline Habitat Conditions

Table 3-19: Prescription Watershed Information, Refer to Hydrology Section for Sediment Yield and Entry Frequency Guidelines

Prescription Watershed	Acres	Fishery Water Quality Objective[1] (% Habitat Potential)	Cobble Embeddedness Objective[2] (%)	Existing Cobble Embeddedness[4] (%) (WCE)	Current Fishery Water Quality Habitat Potential (%)
Lodge Creek[3]	2,940	80	30-35	37	-
Unnamed No. 8	876	70	35-40	-	-
Middle Fork Clearwater Face	1,458	80	30-35	-	-
Decker Creek [3]	1,229	80	30-35	37	-
Goddard Creek	9,232	80	30-35	51	60
Swiftwater Creek	3,924	80	30-35	42	60
Elk City Creek	1,800	80	30-35	55	60
Lower Selway River	2,405	90	25-30	46	60
Lower O'hara Creek	2,867	90	25-30	37	70

[1] NP LRMP Appendix A 1987
[2] Potential and current habitat condition is based solely on collected or estimated substrate data methods based on Espinosa 1992.
[3] Surveyed during the 1989 basinwide surveys
[4] Existing cobble embeddedness is mean Weighted Cobble Embeddedness (WCE).

Cobble embeddedness at many of the sample sites have only been sampled once or twice (Elk City (2013), Lodge (1989), Decker(1989), Swiftwater (1989 and 2013), and Goddard creeks (2013)); a small sample size can often skew results and a minimum of three samples are needed to determine trend. A Forest monitoring index site is located on O’hara Creek so there is several years of cobble embeddedness data at this location. The site was sampled 6 times between 1988 and 2014 and mean weighted cobble embeddedness ranges from a low of 10% to 47% with an average of 37%, which, is reported above. No trend was identified between mean weighted cobble embeddedness but, a one-way Analysis of Variance (ANOVA) with a Bonferonni adjustment detected significant increased cobble embeddedness in 1990 and more recently in 2014 (p value= 5. 64 E-12.), refer to Appendix B. There are 7 PIBO sites that are located throughout the Selway basin. A 2013 summary report found that habitat conditions in the Selway managed sites were in poorer condition than reference sites. Although wood frequency and bank angle were similar to reference sites, residual pool depth, pool percent, and percent fines exhibited worse condition than reference sites. PIBO effectiveness monitoring began in 2001 on a 5 year sampling rotation, during this time, there was a significant increase in percent fines but, other habitat perimeters remained constant. Results could be somewhat skewed given the small sample size of both managed and reference sites, which, might be the case given both Selway managed and reference reaches were in poorer condition than other sites across the NPCLW Forest and the entire PIBO study area (entire Columbian Basin), refer to 2013 PIBO report in the project file for a full synopsis. High cobble embeddedness could be attributed to past management practices and frequent natural disturbances given climatic events and unstable soil condition. Many of these watersheds have high gradient streams that can transport sediment efficiently although small amounts large wood material and lower gradient stream reaches, where cobble embeddedness sampling takes place can effectively store large proportions of fine sediment possibly contributing to high cobble embeddedness.

Habitat surveys and temperature monitoring data were used to summarize existing habitat condition in Table 7 below. Basin-wide surveys were conducted on Lodge, Decker, O'hara, Goddard, and Swiftwater creeks in 1989. Updated surveys have been conducted on Swiftwater Creek (2013), and O'Hara Creeks (2014).

Table 3-20: Existing Condition by Subwatershed, High, Moderate and Low rankings are extrapolated from the Matrix of Pathways and Indicators of Watershed Condition (NMFS, USFWS 1996). H=High watershed condition, M=Moderate watershed condition, L=Low watershed condition

	Big Smith Creek-Middle Fork Clearwater River	**Goddard Creek-Selway River**	**O'Hara Creek**
Watershed Condition			
Road density[1] (mi/mi^2)	2.90 M	1.90 M	1.40 M
RHCA Road Density (mi/mi^2)	0.01 H	0.2 H	0.21 H
Landslide Prone Road Density (mi/mi^2)	0.11 H	0.15 H	.09 H
Water Quality			
Temperature [2] (Steelhead spawning/rearing)	N/A	Selway >64°F L, Swiftwater 57-64°F M	O'Hara 57-64°F M
Habitat access	Natural barrier on Lodge Cr. 0.4 miles from mouth and a natural barrier on Decker creek 0.80 miles from the mouth.	No barriers documented	No barriers documented
Pool Quantity/ Quality	L-Does not meet RMO, primarily riffle habitat, given high gradient stream channels, and primarily scour pools less than 3 feet in depth, low mean annual flows 1.3 to 3.92 cfs.	M-Meets RMO, there is a large percentage of pool habitat on Goddard Creek with active LWD contributing to pool formation. Swiftwater Creek is below the RMO for pool quantity with primarily riffle habitat. Many pools available are <3 feet deep.	L mainstem O'Hara Creek is below RMO for pool quantity but pool habitat that is available is ~ 3 feet in depth. The 1994 stream survey did not distinguish between pool formations but, pools in Lower O'Hara creek are thought to be 30% mainstem pools from LWD complexes with the remainder in pocket water/alcoves.
Large Woody Debris	L-does not meet RMO,	M-levels of LWD are near-	L-does not meet RMO, there is

	Big Smith Creek-Middle Fork Clearwater River	Goddard Creek-Selway River	O'Hara Creek
Watershed Condition			
	there is potential for LWD recruitment and large boulders/bedrock create majority of pool habitat.	natural on Goddard Creek and future LWD recruitment is not limiting. L-Swiftwater Creek LWD is below RMO but there is opportunity for LWD recruitment throughout many of its reaches. Boulders/bedrock create a majority of the pool habitat.	opportunity future LWD recruitment. During the 1990's a successful large instream habitat improvement project placed several LWD structures to increase pools and side channel rearing habitat.
Off-Channel Habitat/Refugia	Limited side channel habitat streams are A2-A3 channel types with few backwaters.	Goddard Creek (B1 channel type) provides adequate off-channel habitat and refugia. There is very little side channel habitat on Swiftwater Creek due to A3 channel type ¾ the length of the stream. ¼ of the stream is B1 channel type providing marginal refugia.	Portion of lower O'Hara creek floodplain have been compromised due to road placement FS 651 Rd. Surveys did not specifically indicate lack of off-channel refugia but, it is assumed limited given valley width and compromised channel dynamics. The mainstem glide habitat and pocket water provide the majority of rearing habitat for juvenile salmonids during the summer months.

[1]Refer to hydro report for water Yield, ECA analysis and sediment yield accounts for FS, private and state roads.
[2] Refer to Appendix B, Selway River avg 7 day Max. 72°F (1993-2014), Swiftwater averages 59°F and O'Hara averages 64°F.

3.5.6.3 Temperature

High temperatures on the Selway River are considered a limiting factor for some fish distribution/rearing during the summer months. Temperatures are not considered limiting to steelhead spawning due to timing of spawning during peak flow events in the spring. Temperatures on the mainstem Selway River are marginal for Steelhead rearing during the summer, and juvenile steelhead, cutthroat and spring/fall Chinook likely find coldwater refugia in tributaries such as Swiftwater, Goddard, Elk City and O'Hara creek (Appendix B). All temperatures exceed ideal rearing/spawning for bull trout. This is reflected in snorkel survey data and fish density numbers, refer to Appendix A). The Selway and Middle Fork Clearwater are used primarily as migratory corridors for bull trout during the late spring early summer months but, can provide overwintering habitat for bull trout.

3.5.6.4 Riparian Conservation Areas

Riparian areas are dominated by western red cedar and grand fir with understory of moist shrubs, forbs and ferns. Approximately 381 acres of past timber harvest (NCT/CT) have occurred within RHCAs on FS lands within the project area (Big Smith-Middle Fork

Clearwater 195 acres, Goddard-Selway 146 acres, and O'Hara 40 acres) . The majority of past harvest occurred in Upper Lodge Creek during the 1960s. The existing ECA increase among the watersheds range from 3% to 20%; this factors in fire disturbance from the Johnson Bar Fire, which, was concentrated in landslide prone areas. There is currently only light cattle use from the Tahoe-Clear Creek allotment (4,907 acres within the Project area), this is partially due to the existing vegetation and steep terrain in the Goddard-Selway and Big Smith-Middle Fork Clearwater subwatersheds.

Existing transportation system are a major sources of sediment and continued watershed degradation stem from the O'Hara FS 651 Rd that is adjacent to O'hara Creek and the Selway River Road, FS 223 Road that follows the Selway River from its mouth 19.5 miles upstream past Selway falls.

3.5.7 Direct and Indirect Effects

Proposed project activities that may affect the quality, quantity, and timing of streamflows are listed below. Harvesting and any prescribed fire activities would be closely managed; thereby, limiting the potential for impacts to ESA listed fish species and their critical habitats. This would be due primarily (but not exclusively) to Best Management Practices (BMPs) and project specific design criteria. The activities considered for potential effects include timber harvest, road construction, maintenance, decommissioning and storage and site preparation for planting. These activities have to potential to contribute sediment to streams and affect fish species.

Design features used to minimize or eliminate effects to streams include:

- Retention of PACFISH buffers adjacent to streams and wetlands would maintain shade (where trees did not burn), future instream and riparian wood levels, and stream bank stability
- No timber harvest or road building would occur on field verified landslide prone areas which would minimize potential management-related mass failures and subsequent sediment delivery to streams.
- Harvest machinery would not be serviced in riparian areas. This would eliminate potential toxic chemical introductions into streams;
- Danger trees in RHCAs along haul routes would be felled and left in place in order to maintain large woody material in the RHCAs.
- Dust abatement would be used on logging haul routes to minimize sediment input
- Temporary roads would not be constructed and site preparation for planting would not occur in RHCAs.
- Erosion control measures near stream crossings would be use during road reconstruction, decommissioning, and storage activities

There would be no proposed project activities instream or within the RHCAs of fish-bearing stream portions; therefore, there would be no additional direct effects to aquatic species as a result of implementing the Proposed Action or Alternatives.

Regional Sensitive Species

Table 3-21: Determination of Effects to Regional Sensitive Species

R1 Sensitive Species	Determination		Rationale
	Alt.1 No Action	Alt. 2-4 Action Alternatives	
Spring Chinook Salmon	MIIH[1]	MIIH	Refer, to Fall Chinook comments. Proposed harvest activities with Project specific design criteria and BMPs would have negligible direct or indirect effects to Spring Chinook under all Alternatives. Given location of EFH to proposed activities post-fire and cumulative effects would have limited or negligible effects to EFH.
Interior Redband trout	NI[2]	NI	No known isolated populations of Interior Redband trout have been documented. Refer to Steelhead Effects Determination.
Westslope Cutthroat Trout (WCT)	MIIH	MIIH	Under Alt1. adverse effects to WCT are limited to short-term increases in sediment deposition and altered hydrologic process post-fire but, overall post fire disturbance would have long-term benefits to fisheries with increased fish densities and habitat complexity (Table 3-23). Project design criteria, BMPs and logging system methods and temp road construction would have negligible direct or indirect effects to steelhead under all Alternatives; however, connected actions such as road decommissioning could have measurable short term increases of sediment but, with potential long-term watershed benefits. Cumulative effects specifically, salvage operations on IDL and private lands could have negative measurable effects to WCT habitat given proximity, duration and magnitude of proposed actions to occupied WCT habitat in lower Swiftwater (Map 7).
Pacific Lamprey	MIIH	MIIH	Post-fire effects are less detectable on the Selway and Middle Fork Clearwater rivers. Given location of occupied habitat on the Selway and Middle Fork Clearwater river, proposed project activities with design criteria, BMPs and logging system methods and location of temp road construction would have negligible direct or indirect effects to Pacific Lamprey under all proposed Alternatives.
Western Pearlshell Mussell	MIIH	MIIH	Post-fire effects are less detectable on the Selway and Middle Fork Clearwater rivers. Given location of occupied habitat on the Selway and Middle Fork Clearwater river, proposed

[1] May Impact Individuals and Individual Habitat but, is not likely to result in a trend toward federal listing, and continued viability is expected on NPCLW NF

[2] No Impact to Individuals and Individual Habitat.

R1 Sensitive Species	Determination		Rationale
	Alt.1 No Action	Alt. 2-4 Action Alternatives	
			project activities with design criteria, BMPs and logging system methods and location of temp road construction would have negligible direct or indirect effects to WPM under all proposed Alternatives.

3.5.7.1 Alternative 1

Under Alternative 1, the Forest Service would not change management actions in the project area. There would be no proposed harvest, prescribed fire activities, or road maintenance/construction. There could, however, be direct and indirect effects from the Johnson Bar Fire itself including mass failure, infiltration, peak flow, runoff, large woody debris recruitment, and to stream habitat.

Table 3-22: Burn Severity by watershed within the Project Area 1= unburned, 2= Low severity, 3=Medium, 4=High

Subwatershed	Burn Severity	Total Acres burned	Acres Burned in RHCAs
Big Smith-Middle Fork Clearwater	1	670	80
	2	1865	234
	3	1046	76
	4	4	0
Goddard-Selway	1	637	121
	2	3059	719
	3	4481	580
	4	519	15
O'Hara	1	135	21
	2	565	84
	3	268	7
	4	4	0

The Johnson Bar fire is a natural disturbance that has both immediate and long-term consequences for stream ecosystems because it can affect water temperature, channel morphology, stream biota and habitat complexity. The fire burned with mixed severity across approximately 13, 300 acres. The complexity of the landscape led to the mosaic burn, majority low to moderate severity, with only a small percentage of riparian area that actually burned (Table 3-22). No drainage burned in entirety, the greatest burn severity within RHCAs was within the Goddard-Selway subwatershed with moderate burn severity in the upper portions of Burned Creek and Elk City creeks, refer to the Fire and Fuels analysis.

Fire effects on aquatic systems and biota can be extremely resilient to the effects of fire, and even benefit from it, full ecosystem recovery dependent on acres burned and burn severity can take decades. There are very few studies that have examined short-mid and long term effects of fire on aquatic biota. In general, fire impacts on different streams are expected to vary, dependent with intensity, and extent of burning of a watershed and the vegetation previously present. Fire response are most likely to be seen in watersheds where the upper portions were heavily forested and were extensively burned but, impacts are expected to vary along a given stream system with the greatest fire impacts seen in smaller headwater streams, effects lessening downstream. The slope aspect, elevation, gradient, geology and soil depth along with climatic variables affect runoff and erosion rates (Minshall *et al*. 1989).

Effects of fire on stream ecosystems can be partitioned into immediate or short-term effects directly from the fire such as increased temperatures and poor water quality from the fire itself. Although fires may alter stream temperature by affecting the magnitude of surface and subsurface flows, and rates of evaporation, convection and conduction, the primary driver is increased solar radiation following immediate loss of riparian vegetation (Webb *et al*. 2008). Research has also found that increased debris flow from post-fire peak flow events can result in wider, shallower stream channels that can absorb more solar radiation (Dunham *et al*. 2007). Similar to other studies, Mahlum *et al*. (2011) found water temperature increases were not detected directly after the fire but in subsequent years (1-3 °C increase, 1 to 7 years). These fire effects monitored in the Bitterroot Mountains of Montana found warming stream temperatures associated with only burned areas and were fairly localized. Increases in stream temperature can be moderated by evaporation, hyporheic exchange and conduction to substrate and return any increased stream temperatures to normal levels within relatively short distances (Moore *et al*. 2005). Water chemistry parameters were not measured directly after the fire but, past research suggests few adverse effects from the Johnson Bar Fire are expected (Minshall *et a*l. 1989, Johnson et al. 2005, Schindler et al. 1980). Any changes in water chemistry would be expected during peak runoff events in the spring and not detectable in the long-term (Bladon *et al*. 2008, Hauer *et a*l. 1998).

Delayed post fire effects have maximum impacts within the first one to four years after the fire. These mid to long-term effects can be the most lasting effects to stream habitat and biota and include increased instream sediment and turbidity from post-fire flooding and debris torrents. Debris torrents can reconfigure the stream channel itself and are the primary mechanism for instream large wood recruitment. Rain events shortly after the fire can produce an increase in sediment in the months immediately after the fire. The following runoff from snowmelt is expected to carry abnormally high suspended-sediment loads, decreasing with vegetation, however, and intense summer precipitation several years after the fire could cause departures from this decreasing trend. Increased sediment erosion from burned watersheds with elevated suspended sediment levels during spring run-off events invariably result in increased sedimentation downriver. Long-term effects are closely aligned with the recovery of the forest and understory vegetation. Recovery should result in shading of the streams, decreased runoff and input of nutrients, returning conditions to prefire levels. Fallen and fire killed snags continue to accumulate in streams for 20-25 years after fire but, retention of woody debris is a direct function of the size of the material relative to the width and depth of the stream.

Since the Johnson Bar fire burned with mixed severity with little burn intensity in riparian areas, increases in stream temperatures due to the wildfire should be fairly localized. Warming stream temperatures could be detectable in the short term in headwater streams that burned with moderate to severe fire intensity but, rapid riparian vegetation of forbes, grasses, and shrubs in these low elevation rain-dominated systems, could provide effective shade cover in these smaller stream reaches. Warming temperatures due to widening of the stream channel and loss pool habitat from debris torrents is a possibility but, these effects are assumed to be short to mid-term given the dynamic nature of these small headwater streams. Warming stream temperatures in the larger third and fourth order stream systems such as, Swiftwater, Goddard and Elk City creeks should be less detectable given the mixed burn severity, and watershed size moderates temperature effects.

The unburned RHCAs lend somewhat of a protective buffer from erosional events, however, as suggested above, many of these upper stream reaches that endured severe to moderate burn severity and are characterized by steeper slopes (>45%), shallow soils, unstable geology that endure intense precipitation events and are the main conduits for post-fire sediment transport. The hydrology report (NEZSED) compares sediment yield by year post-fire, this data suggest increased sediment yield above natural condition until 3 years before it returns to normal variation. Post-fire sediment yields from peak flows and altered hydrograph can dramatically change stream channel dimensions. An unpublished study in the Upper Selway Subbasin (Jakober and Dentino, 2003) changes in stream channel complexity with no consistent pattern between years. Pool variables did not show consistent trends with frequencies and depths showing initial declines but, pool areas and volumes later showing large increases in some stream drainages in the six years following the Swet Fire.

Increased sediment yields following debris torrents within the Johnson Bar fire are not all negative and may actually stimulate recovery or compensate for habitat losses that might be enhanced by post-fire disturbance. Post fire hydrologic effects can be characterized as pulsed disturbances redistributing quality rearing and spawning substrate and shifting pool habitat throughout these stream systems. These events are episodic and dispersed through time and space, important for sustained productivity/recruitment of fish after large fire disturbances.

It is expected that although habitat complexity such as pool structure can be variable and inconsistent across drainages as identified in the Bitterroot study, there would be newly available habitat that is broadly distributed promoting recolonization and increased fish densities through the stream system. Recruitment of large woody debris increased by 60% in Jakober and Dentino's past study and was consistent across the drainages with rapid recovery of bank stability to normal levels (1-2 yrs after the fire). Given the moderate burn severity across many of the drainages within the project area and steep channel slopes there is the possibility of some future large wood recruitment. However, wood recruitment would primarily be focused in these headwater reaches benefitting resident fish community habitat such as Westslope cutthroat trout with limited wood disbursement downstream to Swiftwater, Goddard, Elk City and O'Hara creeks that would benefit anadromous fish habitat.

There was no observation/evidence of direct mortality of fish during or shortly after the Johnson Bar fire. This is not surprising given the majority of RHCAs that burned had none or limited fish distribution/occupied habitat. Due to these possible increases in post-fire habitat complexity, recolonization and juvenile densities are expected to increase in some portions of these stream reaches. Studies have shown that resident fish such as redband, bull trout and westslope cutthroat have the ability to quickly adapt to changes in their environment associated with even the most intense wildfire effects (Dunham et al. 2007, and Rieman et al. 1997, Jakober and Dentino 2003). The steelhead/redband and WCT populations are assumed ecologically diverse and unfragmented from the greater Selway River so, dispersal from local refuge and refounding through complex life history can happen in stream reaches that were disturbed from post fire effects. Table 3-23 below, summarizes indirect effects under Alternative 1.

Table 3-23: Summary of Indirect Effects under the No Action Alternative, common to all subwatersheds

Action	Process Affected	Indicator	Alt. 1
Johnson Bar Fire	Surface erosion	Pulse and Chronic Sediment	0
	Mass failure	Pulse sediment	S-/0
	Infiltration, peak flow, runoff	Hydrologic Process	S-/0
	LWD Recruitment	Potential LWD	S+
	Temperature	Riparian Shade	-/0
	Stream Habitat	Pool Quality/refuge	S-/S+
	Drainage Network	Road density/stream crossings	0

0 = Neutral Indirect Effects
- = Insignificant or discountable negative effects
+ = Insignificant or discountable positive effects
S- = Measurable negative effects
S+ = Measurable positive effects
/ = Short term/long term effects

3.5.7.2 Alternatives 2, 3, and 4

The following direct and indirect effects are common to Alternatives 2, 3, and 4.

Sediment yield increases as a result of implementing proposed activities would be within the water quality objectives as outlined in Appendix A of the Nez Perce Forest Plan. The NEZSED model results displayed that proposed actions for Alternatives 2, 3, and 4 would not -add to measurable sediment increases above post-fire disturbance levels. With the exception of winter rearing capacity along Elk City Creek, FISHSED detected a reduction in the winter and summer rearing capacity for steelhead of1-6%. There were no differences between the alternatives. These changes would be below the 10% threshold where measurable changes would occur within the stream substrate. FISHSED is strictly a comparison of summer and winter rearing capacity and does not model long-term differences in rearing capacity. NEZSED resulted indicated that long-term impacts (>10 years) would not be measurable. Aside from the FISHSED model, stream gradient channel size and the lack of overall pool habitat along Elk City Creek provides minimal winter rearing habitat.

In general, post-fire sediment increases from the proposed activities would decline to normal conditions after 2-3 years. This has been documented in several other studies that found increases in stream sediment inputs shortly after a fire and 2-3 years post-fire (Chou *et al*. 2004, Larsen *et al*. 2009, Moody and Martin 2001 and 2009, Pierce *et al*. 2004, Robichaud *et al*. 2010, and Stabenow *et al*. 2006). Sediment increases above fire disturbance levels would be undetectable for Alternative 3, which would have very few tractor logging units (approximately 2% of the proposed project area) and very little temporary road construction. Road decommissioning and road reconstruction would be the greatest source of sediment delivery under Alternative 3, but, would have long-term watershed benefits.

Numerous studies have attributed increases in soil erosion above post-fire disturbance levels to salvage operations, due to increases in road networks that have hydrologic connectivity with stream networks, additional prescribed fires, harvesting on landslide prone areas, and ground based harvest (DellaSala *et al*. 2006, Karr *et al*. 2004, McIver and McNeil 2006, McIver and Starr 2001, Silins *et al*. 2009, Smith *et al*. 2011, Wagenbrenner *et al*. 2014). All of these studies acknowledge significant differences between logging systems and actual ground disturbance. Tractor logging has the greatest impacts, followed by skidding over snow, cable yarding over bare ground, skyline, and finally helicopter activities having the least amount of impacts. There are no activities proposed that would increase roads that are hydrologically connected to streams and no harvest on verified landslide prone areas. No ground based harvesting would occur on steep slopes and slash/large wood would be retained in harvest units to minimize compaction and potential erosion.

Table 3-24: Indirect Effects, Short and Long-term, by Action and Alternative (2-4), Common to All Subwatersheds

Action	Process Affected	Indicator	Alternative 2	Alternative 3	Alternative 4	Rationale
Vegetation Treatment	Surface erosion	Pulse and Chronic Sediment	-/0	0	-/0	Tractor units confined to ridge top. No harvest within RHCAs. Refer to Hydrology report. Sediment yield meets allowable water quality objectives under Nez Perce Plan Appendix A. NEZSED models display increased sediment yields due to the post-fire sedimentation with proposed activities under Alternatives 2 and 4 slightly increasing sediment yields tons/year for the duration of the project (2 years) than quickly returning to natural condition. Alternative 3 proposes very little tractor logging (2%) and was not modeled to increase sediment yield above natural fire disturbance. Helicopter and skyline units have reduced soil disturbance, 85% soil coverage 17-33 tons of fine and course woody material within units mitigate additional soil erosion.
	Mass failure	Pulse sediment	0-	0-	0-	Landslide prone (LSP) eliminated from proposed units. Skyline and helicopter units dramatically decrease soil disturbance, tractor units under all alternatives refined to ridge top.
	Infiltration, peak flow, runoff	Hydrologic Process	0-	0	0-	Refer to Hydrology report, ECA increase is negligible. Proposed activities under all alternatives would not alter the hydro graph compared to fire disturbance.
	Large Wood Debris Recruitment (LWD)	Potential LWD	-/-	0-	-/-	Target stand density would provide for some future LWD recruitment. No harvest within RHCAs. Given slope and natural disturbance within the project area, there is LWD Potential but, primarily limited to small headwater streams.
	Temperature	Riparian Shade	0	0	0	No harvest within RHCAs,

Action	Process Affected	Indicator	Alternative 2	Alternative 3	Alternative 4	Rationale
						no mechanism to alter temp beyond fire disturbance.
	Stream Habitat	Pool Quality/refuge	-	0	-	Refer to surface erosion comments, increased sediment, would unlikely result in measurable degradation in pool quality/refugia in downstream fish bearing streams.
Temporary Road Construction	Surface erosion	Pulse and Chronic Sediment	-	0	-	Refer to Project design criteria; all temp roads would be decommissioned. Only 0.4 mile is proposed under Alternative 3. There would be no hydrologic connectivity with nearby waterbodies; There would be no new construction within RHCAs and thus no increase in stream crossings.
	Mass failure	Pulse sediment	0	0	0	Project design criteria and BMPs designed to reduce sediment input, no construction on LSP.
	Infiltration, runoff, peak	Hydrologic Process	0	0	0	No mechanism to alter peak flows
	LWD Recruitment	Potential LWD	0	0	0	No construction in RHCAs
	Temperature	Riparian Shade	0	0	0	No construction within RHCAs
	Stream Habitat	Pool Quality/refuge	0	0	0	BMPs, no hydrologic connectivity and no construction within RHCAs
	Drainage Network	Road density/stream crossings	-/0	0	-/0	A temporary increase in drainage network, road construction is not within RHCAs, all roads would be obliterated after use.
Road Recon/Improvement	Surface erosion	Pulse and Chronic Sediment	-/S+	-/S+	-/S+	Drainage system improvements may temporarily increase sediment to non-fish bearing reaches but, the 57.8 miles of road improvements would significantly decrease long-term sediment loads, refer to Hydrology report.
	Mass Failure	Pulse sediment	-	-	-	Road density is minimal in landslide prone areas
	Infiltration, runoff, peak	Hydrologic Process	0	0	0	No mechanism to alter peak flows
	LWD Recruitment	Potential LWD	0	0	0	No mechanism to alter LWD recruitment, hazard trees within the RHCAs would be felled and left
	Temperature	Riparian Shade	0	0	0	No mechanism to alter temperature

Action	Process Affected	Indicator	Alternative 2	Alternative 3	Alternative 4	Rationale
	Stream Habitat	Pool Quality/refuge	+	+	+	Decrease sediment yield from road improvements could have some measurable effects
	Drainage Network	Road density/stream crossings	+/S+	+/S+	+/S+	No change to road density but, improved stream crossings would decrease long-term sediment inputs
Road Decommissioning and Storage	Surface erosion	Pulse and Chronic Sediment	S-/S+	S-/S+	S-/S+	Dependent on proximity to streams, there would be short-term sediment increases with long-term decreases in sediment inputs. Refer to NEZSED model figures in Appendix C.
	Mass Failure	Pulse sediment	0+	0+	0+	Approximately 3.0 miles of road decom is located on LSP.
	Infiltration, runoff, peak	Hydrologic Process	+	+	+	Road decom can increase long-term soil productivity
	LWD Recruitment	Potential LWD	0	0	0	No mechanism to alter LWD recruitment
	Temperature	Riparian Shade	0	0	0	No mechanism to alter Temperature
	Stream Habitat	Pool Quality/refuge	+/S+	+/S+	+/S+	Long-term reduction in sediment inputs due to reduced stream crossings, watershed road density and overall increase in soil productivity could result in potential measurable increases in habitat quality.
	Drainage Network	Road density/stream crossings	S+	S+	S+	Decreases road density and stream crossings, refer to hydrology report

0=Neutral Indirect Effects
- =Insignificant or discountable negative effects
+ = Insignificant or discountable positive effects
S- = Measurable negative effects
S+ = Measurable positive effects
/ = Short-term/long-term effects

3.6 Rare Plants

3.6.1 Analysis Area

The analysis area for this assessment includes only the approximately 13,000 acres of NFS lands, all of which occur across drainages in the Middle Fork Clearwater River and Lower Selway Watersheds: more specifically, Decker, Swiftwater, Elk City, Goddard and O'Hara Creeks.

3.6.2 Regulatory Framework

Forest Plan direction and all Federal and State laws and regulations pertaining to the management of rare plants on the Forest would be applied to the project, including the NFMA of 1976 and the Endangered Species Act.

3.6.2.1 Endangered Species Act

Threatened and endangered species are designated under the Endangered Species Act (ESA). The four plants listed as threatened that occur in Idaho are Macfarlane's four-o'clock (*mirabilis macfarlanei*), Water howellia (*Howellia aquatilis*), Ute Ladies'-Tresses (*Spiranthes diluvialis*) and Spalding's catchfly (*Silene spaldingii*). According to U.S. Fish and Wildlife Service, Water howellia (Howellia aquatilis) and Ute ladies'-tresses orchid and their habitat are not found on the Nez Perce National Forest and would not be further addressed. The project area does not contain landscape characteristics, plant community composition or community structure that would suggest suitable habitat for Spalding's catchfly (*Silene spaldingii*) or Macfarlane's four-o'clock (*Mirabilis macfarlanei*), based on current knowledge of existing habitat for these species. According to the latest U.S. Fish and Wildlife Service Species List Update 8/2013, no federally listed plant species or proposed critical habitat occurs on the Moose Creek Ranger District, therefore these species would not be considered further. Slickspot peppergrass *(Lepidium papilliferum*) has been recently listed as Proposed for Idaho, but this southern Idaho Species does not occur on the Nez Perce National Forest.

3.6.2.2 Sensitive Plants

Sensitive species are those plant and animal species identified by the Regional Forester for which population viability is a concern, as evidenced by substantial current or predicted downward trends in population numbers, density, or habitat capability that reduce a species existing distribution. Management direction for sensitive species is to ensure that species do not become threatened or endangered because of Forest Service actions and to maintain viable populations of all native species. The most recent update to the sensitive species list was published in 2011 The Forest Service must evaluate impacts to sensitive species through a biological evaluation. All Nez Perce Forest sensitive plant species have been evaluated as to their presence, presence of their habitat, and whether the species or habitat may be potentially affected.

3.6.3 Analysis Methodology

Species information is based upon existing information, Idaho Conservation Data Center (CDC) data, GIS modeling of habitat parameters, photo interpretation, and field surveys. Individual species requirements were reviewed and appropriate modeling criteria selected to determine which species or corresponding habitat would be expected to occur in the project area.

Forest Service Botanists conducted TES Plant surveys during the summer of 2013 within the Middle Fork Clearwater River Watershed. These field surveys were a spot check of various habitats (riparian and terrestrial) and proposed "focus areas" that were being considered for possible future vegetation treatments along the Middle Fork Clearwater River. Understory plant species included: Ninebark (*Physocarpus malvaceus*), Ocean spray *(Holodiscus discolor*), wild ginger *(Asarum caudatum*, Sitka alder (*Alnus sinuate*), Western goldenthread *(Coptis occidentalis*), Pearly everlasting *(Anaphalis margaritaceae*), Common yarrow (*Achillea millefolium*), twinflower (*Linnaea borealis*), queen cup beadlilly (*Clintonia* *uniflora*), Montana golden pea (*Thermopsis montana*), common snowberry (*Symphoricarpos albus*), mountain maple (*Acer glabrum),* prince's pine (*Chimaphila umbellate*), Pioneer violet (*Viola glabella*) and mountain ash (*Sorbus scopulina*). No Federally Proposed, Threatened,or Endangered Plant Species or potential habitat, were found.

3.6.4 Resource Indicators

Vegetation management, temporary road construction and logging activities could directly affect some plant species. Indirect effects may include the expansion of weeds and the mitigating treatments of these infestations or changes to the forest canopy that may affect light and temperature regimes. Cumulative effects are the overall effects to species from past, present and reasonably foreseeable future projects. Historically such effects on individual species was not measured or noted. However, the past effects on general habitat condition can be qualified and matched to species dependent on a particular habitat. For this reason, local landtype classifications (Vegetation Response Units) are used for the direct, indirect and cumulative effects discussions. The effect on potentially suitable habitat is the primary indicator used in the analysis.

3.6.5 Affected Environment

Habitats within the Johnson Bar Salvage project area are dominated by the Idaho Batholith Breaklands (VRU 8) with moist Western red cedar (*Thuja plicata*) and grand fir (*Abies grandis*). These habitats are generally cooler, wetter and associated with the maritime coastal disjunct plant species. A relatively small portion is classified as Uplands (VRU 10 and 17) which are generally cooler, above the Breaklands and have a more rolling topography. Typical potential vegetation in these habitats include grand fir, western red cedar, and shrubs (alder). Before the Johnson Bar Fire in 2014, ninety percent plus of the analysis area was in a closed canopy condition of various age classes of 40 plus years of age. Structural stages differ by the respective Vegetation Response Units (VRUs) but in general the Breaklands and Uplands trend low in the 0 – 40 age class and are overabundant in the 41-100 year age class. Riparian Habitat Conservation Areas (RHCAs) designated as PACFISH buffers constitute approximately 25% of the analysis area and approximately 4% of the analysis is old growth.

SENSITIVE SPECIES

Habitat does exist for eleven Sensitive Plant Species found on the Nez Perce National Forest, however only three of these sensitive species; Pacific dogwood (*Cornus nuttallii*), Clustered ladyslipper (*Cypripedium fasciculatum*), and Constance's bittercress (*Cardamine constancei*), are known to exist in the analysis area. During previous botanical surveys of the site, these 3 Forest Sensitive Plant species were found growing within the areas proposed for treatment across the Middle fork Clearwater River Watershed. Most of the known Sensitive Plant Species growing in the drainage are located in the upper reaches, where some treatments are planned, and several are scattered along riparian areas of the watershed where habitat would be protected by implementation of PACFISH Riparian Habitat Conservation buffers.

According to records from the Idaho Conservation Data Center (ICDC) and field surveys from 2013 and prior years, there are three sensitive plant species known to occur within some of the proposed fire treatment areas. Two of those species, Constance's bittercress (Cardamine constancei) and Clustered ladyslipper (Cypripedium fasciculatum) are found to be much more abundant than previously thought. However, potential habitat exists in the project area for 11 sensitive plant species, Table 3-25 lists those plant species or their habitats that would be affected by the Johnson Bar Fire Salvage project. Sensitive species not included in the table are not known or suspected to occur in the project area, nor is suitable habitat present based upon existing information or habitat modeling. These species are accounted for in the Biological Evaluation. There are no occurrences or suitable habitat for any Threatened or Endangered plant species listed on the Nez Perce Forest and they would not be addressed any further in this document.

Table 3-25: Potential Sensitive Plants within the Project Area

Common and Latin Name	**Habitat**	**Presence**	**Habitat/Community Type**	**Elevation (feet)**
Deerfern *Blechnum spicant*	Present	Potential	Coastal disjunct population in Idaho, moist to wet foersts, generally heavily shaded	1,500-3,000
Lance-leaf moonwort *Botrychium lanceolatum var.lanc*.	Present	Potential	A wide variety of habitats, including wet to moist grassy and rocky slopes, woods, and edges of lakes, generally at fairly high elevations, soils tend to be cold and subacid.	1,500-6,000
Mingan moonwort *Botrychium minganese*	Present	Potential	Shaded moist sites under mature western red cedar and various conifers, dry to moist meadows	1,500-6,000
Northern moonwort *Botrychium pinnatum*	Present	Potential	Shaded moist sites under various conifers. Dry to moist meadows.	1,500-6,000
Green-bug-on-a-stick *Buxbaumia viridis* (moss)	Present	Potential	Moist grand fir or cedar forests on large decayed logs and ash soils	1,500-5,000
Constance's bittercress *Cardamine constancei*	Present	Known	Occurs in moist coniferous woods along rivers and partial shade under western red cedar	1,500-4,000
Buxbaum's sedge *Carex buxbaumii*	Present	Potential	Wet meadows, small fens and seeps on saturated organic soil.	2,000-5,000
Pacific dogwood *Cornus nuttallii*	Present	Known	Forest openings, gaps in low elevation western red cedar along the Selway River	1,500-3,000
Clustered ladyslipper *Cypripedium fasciculatum*	Present	Known	Partial shade of moist western red cedar, Grand fir or Douglas-fir.	1,500-4,800
Light hookeria *Hookeria lucens*	Present	Potential	Shaded areas on saturated soil within the warm/moist western red cedar and mixed conifer forests	Below 4,000
Naked-stem rhizomnium *Rhizomnium nudum* (moss)	Present	Potential	In moist mineral soil of low elevation, warm grand fir and western red cedar forests (including along streams)	2,000-5,000

3.6.6 Direct and Indirect Effects

3.6.6.1 ALTERNATIVE 1

No management activities are proposed under this alternative; therefore, there would be no direct effects on plant species or habitats. Indirectly changes in stand structure would be expected through time, some of which would alter suitable habitats for some sensitive plant species. In mixed-conifer forest types, especially with grand fir and Douglas fir, root disease and insects would continue increased tree mortality as the stands age and potentially create a higher degree of fire risk to the stands.

In general, species requiring late successional forests would see an improvement in habitat quality, while those requiring conditions that are more open would decline barring the absence of substantial fire or other forest disturbance agents such as severe wind or insect and disease epidemics. The increased severity of wildfire is possible due to the increased fuel build up in these areas from increasing insect and disease mortality.

3.6.6.2 ALTERNATIVES 2, 3, and 4

The Johnson Bar Fire of 2014 was located primarily within the Idaho Batholith Breaklands (VRU 8) and reduced ground and ladder fuels with an overall moderate mixed severity burn, with pockets of high intensity soil scarification that created stand openings which changed light and temperature dynamics substantially enough, post burn, to alter the existing potential plant habitat and existing species representation. The proposed salvage harvest treatments would not appreciably change current habitats from a pre-fire closed crown condition to openings with vertical retention of individual and clumps of leave trees. These harvest methods would not increase light and temperature regimes significantly from the current post-fire condition that would alter more early successional, shade intolerant plant and tree species. The implementation of the tractor harvest systems, has potential for moderate mechanical ground disturbance, but the overall habitat conditions likely would not change enough to affect most later successional, shade tolerant plant species. Habitats preferred by late successional, closed canopy dependent species are generally associated with Resource Habitat Conservation Areas (RHCAs) which are excluded from harvest under PACFISH guidelines. Additionally, all alternatives exclude harvest of old growth.

Road decommissioning and reconditioning would maintain current conditions for sensitive plants. Generally, old roads that are candidates for decommissioning do not provide habitat for these species. Temporary roads are a direct disturbance to suitable habitats. When temporary road segments are sorted by potential habitat for sensitive plant species, it is assumed that for each mile of road constructed, approximately 2.5 acres of habitat would be reduced over the short term. A total of approximately 8 acres of habitat could be affected under Alternative 2, 1 acre under alternative 3, and 9 acres under alternative 4. Sites for proposed soil restoration or stabilization generally are not considered suitable habitat, and not considered when determining the effects of this project.

All three of the Forest Service Sensitive Plant Species known to exist within the proposed project area Constance's bittercress (*Cardamine constancei*), Pacific dogwood (*Cornus* *nuttallii*), and Clustered ladyslipper (*Cypripedium fasciculatum*) were determined to be potentially affected by alternatives 2,3, and 4. Timber harvest, road construction and the associated soil scarification have the potential to disturb existing individual plants. However, due to the relative abundance of known occurrences, low levels of potential habitat negatively affected and the design criteria listed below, it was determined that the action alternatives may impact individuals, but not likely to cause trend toward Federal Listing or reduced viability for the overall population or species. Table 3.26 Lists Summary of Effects (Reference TES Plant BA/BE in Project Record).

The following project design criteria would limit negative effects to sensitive plant species:

- No harvest would occur within PACFISH buffers
- No harvest would occur within old growth
- Pre-sale personnel would report any occurrences or suspected occurrences of sensitive plant species to the Zone Botanist to evaluate the need for mitigation measures.

SENSITIVE PLANT EFFECTS DETERMINATIONS

Determination of effects on sensitive plant species by the proposed project are summarized by the checklist below. Only plant species that have potential habitat in the project area are included in the table below.

Table 3-26: Summary of Effects for Regional Designated Sensitive Plant Species (Includes all action alternatives)

LATIN NAME	Common Name	CAT.	Species Present	Habitat Present	Species Potentially Affected	Habitat Potentially Affected	Determination
Blechnum spicant	Deerfern	*S*	No	Yes	No	No	NI
Botrychium lanceolatum var.lanc.	Lance-leaf moomwort	S	No	Yes	No	No	NI
Botrychium minganese	Mingan moonwortf	S	No	Yes	No	No	NI
Botrychium pinnatum	Northern moonwort	S	No	Yes	No	No	NI
Buxbaumia viridis (moss)	Green-bug-on-a-stick	S	No	Yes	No	No	NI
Cardamine constancei	Constance's bittercress	S	Yes	Yes	No	No	MI
Carex buxbaumii	Buxbaums sedge	S	No	Yes	No	No	Ni
Cornus nuttallii	Pacific dogwood	S	Yes	Yes	No	No	MI
Cypripedium fasciculatum	Clustered ladyslipper	S	Yes	Yes	No	No	Mi
Hookeria lucens	Light hookeria	S	No	Yes	No	No	NI
Rhizomnium nudum (moss)	Naked-stem rhizomnium	S	No	Yes	No	No	Ni

Sensitive Species Determination: NI = No Impact; **BI** = Beneficial Impact; **MI** = May Impact individuals or habitat but not likely to cause trend toward federal listing or reduce viability for the population or the species; **LI =** Likely to impact individuals or habitat with the consequence that the action may contribute towards federal listing or result in reduced viability for the population or species.

As stated under the regulatory framework the objective for managing sensitive species is to ensure population viability throughout their range on National Forest lands and to ensure they do not become federally listed as threatened or endangered. The forest plan supports this direction but does not set specific standards and guides for sensitive plants. The alternatives are consistent with this direction to the extent that proposed management actions would not adversely affect viability of existing sensitive plant populations or their associated habitats.

3.7 Recreation and Trails

3.7.1 Analysis Area

The Analysis Area for recreation and trail resources includes the entire project area plus an area immediately adjacent to the project boundary that includes developed recreation sites, dispersed camping areas, and roads and trails that meander in and out of the project area.

3.7.2 Regulatory Framework

All alternatives would be consistent with the Forest Plan Forest-wide Management Direction and Management Area Direction with regards to recreation and trail resources. Impacts to recreation and trail resources would be temporary.

3.7.2.1 Forest Service Manual

Policy and direction for the management of the trail system are found in the Forest Service Manual, Chapter 2350 and Forest Service Handbook 2309.18.

Policy and direction for the management of developed recreation sites are found in the Forest Service Manual, Chapter 2330, Region 1 Supplement 2330, and Forest Service Handbook 2309.11.

3.7.2.2 Nez Perce National Forest Plan

The Nez Perce National Forest Plan (1987) has a number of goals, objectives and standards that apply directly to recreation resources and influence both the current and future landscape of the project area. Forest wide Goals, Objectives, and Desired Conditions for Recreation and Trail resources are provided below. Specific standards are provided in the Regulatory Compliance section.

- **Goals (page II-1, #5):** Provide a wide range of dispersed and developed recreation opportunities and experiences by providing access, facilities, and education necessary to meet public demand.
- **Objectives (page II-2):** The Forest acreage would supply a broad range of recreation opportunities ranging from primitive to roaded natural. Primitive recreation acreage would remain the same at 40 percent of the Forest, semi-primitive motorized and non-motorized recreation acreage would decrease from 39 to 11 percent, and roaded natural acreage would increase from 21 to 49 percent.

  Developed campgrounds would be managed at least to reduced service levels, except for fee campgrounds which would be managed at full service level. Recreation and trail management would emphasize mitigation of health, safety, and resource problems, and would be at levels commensurate with public use.

  Dispersed recreation opportunities in the general forest environment would be emphasized. Minimum impact camping would be encouraged to reduce management costs and resource impacts. The public would be informed of recreation opportunities through interpretive tools such as a Recreation Opportunity Guide and other recreation materials.

Existing developed recreation site capacity is adequate to accommodate projected use for 3 decades. As use exceeds capacity, the Forest would develop additional sites and expand existing sites in specific locations as public pressure dictates and as private facilities are not able to fulfill the need.

- **Desired Condition (pages II-13 to 15): (**The Forest in 1997) - The trail system would decrease to 2,300 miles; a 42-mile decrease from the 1980 level of 2,342 miles. Use would have increased slightly for developed, dispersed, and wilderness recreation opportunities.

  (The Forest in 2037) - The trail system would remain stable over time. As road access is restricted, the trail system would provide for user activities. Developed recreation use would have increased 17 percent, dispersed recreation use would have increased 19 percent, and wilderness use would have remained about the same. More extensive recreation programs would have become necessary, and six additional campgrounds would have been constructed to meet demand.

3.7.3 Analysis Methodology

Analysis methods include the use of Forest Service databases and GIS coverages for road and trail information. The GIS mileage was used as a relative comparison for analysis for all resource areas. For this analysis, miles of roads and trails open or closed to different vehicles have been calculated using the Forest Service GIS spatial data. The GIS data does not have the ability to account for terrain changes, experience levels, or trail condition.

Effects to recreation opportunity were evaluated from both a quantity and quality perspective. Quality is unimportant if there is no opportunity. Likewise quantity is unimportant if the quality is poor. This analysis analyzes the quantity of opportunities as represented by total recreations sites available for use and total miles available by the various types of uses and season of use. Quality can be described as the comparison of the recreation settings (or opportunities) provided by managers as compared to the expectations of the users. When a user's expectation of what they would experience is aligned with what opportunity is provided, that user's satisfaction is increased and conflict between users is reduced (this is referred to as the Recreation Opportunity Spectrum or ROS).

Determination of effects is primarily based on professional judgment and personal experience.

3.7.4 Resource Indicators

The following resource indicators were developed based on both public comment and internal concerns and are associated with the proposed activities.

- Harvest, timber haul, and helicopter landings are being proposed near dispersed campsites and developed campgrounds, which may impact site conditions, access/availability, and user experiences.
    - *Resource indicator:* Number of sites impacted by harvest.
    - *Resource indicator:* Number of sites impacted by timber hauling.
    - *Resource indicator:* Number of sites impacted by helicopter landings.
- Harvest activities are being proposed adjacent to designated trails, which may impact trail conditions, access/availability, and user experiences.
    - *Resource indicator:* Miles of summer trails impacted.
    - *Resource indicator:* Miles of winter trails impacted.
- Road decommissioning may affect recreational access within the project area.
    - *Resource indicator:* Miles of decommissioned roads by access type.
    - *Resource indicator:* Change in Recreation Opportunity Spectrum.
- The burned area provides opportunities for gathering of forest products, such as mushrooms and firewood, which may be affected by timber harvest activities.
    - *Resource indicator:* Acres available for mushroom gathering.
    - *Resource indicator:* Miles of roads available for fire wood gathering.

3.7.5 Affected Environment

3.7.5.1 Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) is a method for describing recreation settings and opportunities, and is used to evaluate recreation potential for an area. ROS inventories were updated with Forest Plan Revision efforts in 2012. The Johnson Bar Salvage analysis area is shown to have the following existing acres by ROS category.

Table 3-27: Project Area Recreation Opportunity Spectrum

ROS Category	Acres	% of Analysis Area
Rural	0	0
Roaded Modified	38	<1
Roaded Natural	8,178	31
Semi-Primitive Motorized	2,315	9
Semi-Primitive Non-Motorized	15,254	57
Primitive	0	0
Non-FS	1,005	4

The ROS for the analysis area is influenced primarily by the road systems present along the ridges and rivers, which are characterized as Roaded Natural and Roaded Modified, and the steep undeveloped areas between these road systems, which are characterized as Semi-Primitive Non-Motorized.

3.7.5.2 Recreation Activities

Recreation activities in the project area include driving for pleasure, hunting, firewood and forest products gathering, off road vehicle use, and some camping. Several campgrounds and trailheads are located adjacent to the project area and the Selway and Middle Fork Clearwater Rivers are popular for floating and fishing. Private residents are located within the project area and about 60 people reside within the Selway River Corridor. These residents utilize the National Forest administered lands as extensions of their own properties.

3.7.5.3 Recreation Facilities

3.7.5.3.1 Developed Campgrounds

The following developed recreation facilities are present within or adjacent to the analysis area.

Three Devils Picnic Area – located at milepost (MP) 94 on US Highway 12. This site is open year round, weather permitting, and offers 5 picnic tables and grills, a large group fire pit, and 2 toilets. This site is popular for its swimming beach in late summer and is used year round as a rest stop by Highway 12 travelers.

Wild Goose Campground – located at MP 95 on US Highway 12. This campground is open Memorial Day through Labor Day. The campground is popular with local families and has one of few swimming beaches along the Middle Fork Clearwater River. The campground has 7 units, 2 toilets and a water system. A fee is charged at this campground.

Confluence Interpretive Signs – a large paved turnout located on US Highway 12 just downstream of the County Road 223 intersection at Lowell, Idaho. The site overlooks the confluence of the Lochsa and Selway Rivers. This site is also popular with anglers.

Three Rivers Resort – privately owned and operated resort located at the confluence of the Lochsa and Selway Rivers. The resort offers camping, cabins, rooms, a pool, diner, pub, convenience store, and outfitted rafting.

Johnson Bar Campground – located at about MP 2 on County Road 223, this campground is open year round. The site has 7 camp units, a large group site, 4 toilets, and a swimming beach. The swimming beach is popular for day use. A fee is charged for the campsites and group site May through September. There is no fee for day use. This campground was the location of the Fire Camp associated with the Johnson Bar fire suppression efforts and was fully restored following use.

Fenn Ranger Station - located on County Road 223 at about MP 3. The Ranger Station was constructed by the Civilian Conservation (CCC) in the 1940s and is listed on the National Register of Historic Places. There is a small Visitor Center and a self-guided walking tour of the facilities is available.

Fenn Pond Fishing and Picnic Area – located immediately across the road from the Fenn Ranger Station. This site offers accessible fishing and picnicking for people of all ages and abilities. The pond is stocked with trout by Idaho Fish and Game and there is an accessible boardwalk and fishing piers located around the pond. There is a paved parking area, toilet, picnic tables, boardwalk, and fishing piers. The site is currently open but undergoing renovations, which are anticipated to be complete by 2016. No fee is charge at this site.

Cedar Flats RV Dump Station – located on County Road 223 at about MP 3.5 within the Cedar Flats Administrative site. This dump station was recently renovated and was off-line for most of 2013 and all of 2014 camping seasons. It should be fully operational for the 2015 season. The site provides a potable water spigot and RV dumping facilities. No fee is charged at this site.

CCC Campground and Trailhead – located on County Road 223 at about MP 4.5. This site has 3 primitive camp sites and a toilet. The trailhead has a stock loading ramp and hitch rails. This campground is open year round when snow free, and no fees are charged.

O'Hara Campground and Trailhead – located on Forest Road 651 along the Selway River at the confluence with O'Hara Creek. This campground is open mid-May through September. The campground is typically at full capacity on weekends. A Volunteer Camp Host assists with maintenance and upkeep. The campground has 30 units, 7 toilets, and a water system. A fee is charged and sites can be reserved through the National Forest Reservation System. Within the campground is a trailhead for the O'Hara accessible interpretive trail and Stillman Point Trail 335. The interpretive trail is about a 1 mile long and 4-foot wide graveled path with a few benches. The Stillman Point trail is open to motorcycles and travels along the ridge line up to Stillman Point and then connects with Trails 719, 710, and Road 356.

O'Hara Creek Interpretive Site – located on Road 651 along the lower 2 miles of O'Hara Creek. The auto tour, which can also be experienced on foot, horseback, motorcycle, or ATV, provides information about stream restoration efforts that have taken place along O'Hara Creek. Brochures are available at an interpretive kiosk located near the entrance to O'Hara Campground.

Lookout Butte Rental – an old fire lookout tower available for rental June through September is located on Road 1124 between the junctions with Road 286 and Road 1129 on the west edge of the project area. This site is popular with nearly 100% occupancy.

None of the sites were directly affected by the Johnson Bar fire except Johnson Bar Campground, which was used as a fire camp. The site was fully rehabilitated following use. All of the sites were subject to fire traffic, temporary closures, and smoke.

3.7.5.3.2 Dispersed Campsites

Dispersed campsites, also referred to as primitive or undeveloped sites, are those places on National Forest administered lands that are commonly used for camping or day use activities but do not have substantial infrastructure investments (toilets, fire rings, tables, etc.), and what structures may be there are strictly for protecting forest resources, such as sanitation and erosion. These sites are often wide spots along a road or small to moderate alcoves adjacent to open roads. Some of these are routinely used as hunting camps every season and others are only occasionally used. Some sites have user created fire rings, meat racks, or rustic privies. An inventory of dispersed campsites was initiated in 2011 and is ongoing. Twenty-three (23) sites have been identified in and adjacent to the project area. Only 4 of these sites are located within or immediately adjacent to the burn perimeter. The remaining sites were not directly affected by the fire but were subject to fire traffic, temporary closures, and smoke.

3.7.5.4 Recreation Access

3.7.5.4.1 Trails

There are four trails in the project area totaling 19 miles. A variety of motorized and non-motorized uses are allowed on these trails as shown in the table below.

Table 3-28: Trails in the Project Area

Trail Number	Trail Name	Miles in Project Area	Access Prescription
706	Hot Point	5.2	RYA
712	Peterson Point	10.0	OYS1
716	Swiftwater Crosscut	2.8	OYM
715	Peterson Burn	1.1	RYA

RYA - **R**estricted **Y**earlong to **A**ll Motorized Vehicles
OYS1 – **O**pen **Y**earlong to **S**mall Vehicles <50 feet
OYM – **O**pen **Y**earlong to **M**otorcycles

The Hot Point Trail 706 originates off Road 1129D and travels toward Road 1119, then down the ridgeline to Hot Point and then to the Selway River. The last approximate1 mile of the trail crosses lands owned by the State of Idaho. There is no trail easement across the State land. This trail is closed to motorized uses. Trail 706, between Road 1119 and the river, was directly affected by the Johnson Bar Fire and was subject to moderate and high burn severity. In the burned area the trail would see increased numbers of downed trees requiring cut-out and possible drainage issues requiring maintenance.

The Peterson Point Trail 712 originates near the mouth of Goddard Creek at the Selway River. The trail travels up the ridge to Peterson Point and continues uphill until it intersects, and is sometimes coincident, with Road 9701. The trail continues toward Goddard Point and intersects with Road 289. This trail is open to ATVs; however, only that portion of the trail that is coincident with Roads 9701 and 289 is accessible to small vehicles, while the remainder of the trail is not physically suited for motorized vehicles and is, for all practical purposes, closed to motorized use. Trail 712, from Road 1121 down to the river, was directly affected by the Johnson Bar Fire and was subject to mostly low and moderate burn severities, and a small amount of high severity. In the burned area the trail would see increased numbers of downed trees requiring cut-out and possible drainage issues requiring maintenance.

The Swiftwater Crosscut Trail 716 is open to motorcycles and originates from Road 470 and traverses the headwaters of Swiftwater Creek to connect with the Hot Point Trail 706. Only a small portion of Trail 716, located near road 1119A, was directly affected by the Johnson

Bar Fire.

The Peterson Burn Trail 715 is a short trail located between Roads 651 and 9701. This trail is available for hiker and stock use. The trail was not directly affected by the Johnson Bar Fire.

None of the trails in the project area are considered primary access routes or destinations and do not receive regular use or maintenance. Their condition varies from brushed in to barely identifiable on the ground. There is opportunity for trail maintenance and improvement. These trails have not been recently inventoried for erosion or safety concerns.

There are no developed trailhead facilities within the project area. Trailheads for the above mentioned trails are no more than wide spots in the road and none have trailhead signage. There are a few developed trailhead facilities located on the perimeter or just outside of the analysis area. These sites were described in the Developed Recreation Sites section above and include:

- CCC Trailhead, which includes stock handling facilities and a toilet (on Road 223),
- O'Hara Creek Interpretive Site (on Road 651), and
- O'Hara Campground Trail and Stillman Point Trailhead (within the O'Hara Campground).

3.7.5.4.2 Roads

There are 87 miles of system road within the project area. About 5 miles are attributed to County Road 223 (Selway River Road), approximately 45 miles are closed year-round to all motorized vehicles, about 30 miles are open year-round to all vehicles (weather dependent), and the remaining 7 miles are open year-round to vehicles less than 50 inches wide (again weather dependent).

The primary roads in the analysis area include US Highway 12, County Road 223, and Forest Roads 651 (O'Hara-Hamby), 470 (Swiftwater), 653 (Lodge Point), 286 (Tahoe Ridge), and 464 (Boundary Ridge). All of these roads are suitable for passenger vehicles and provide easy access to and within the project area. US Highway 12 and County Road 223 are paved and plowed, while the others are 1½ and 2 lane graveled roads, which are not plowed.

Road 286 (Tahoe Ridge) is sometimes referred to as the "back road to/from Kooskia" from the Selway River and is used as an alternate route to US Highway 12 between Kooskia and the Selway River during summer months for those wanting to enjoy a forest drive or pick-up a load of firewood. This road is also part of a groomed snowmobile system, located outside of, but adjacent to the project area.

The open road system is used by Forest visitors to access the area for a variety of recreational endeavors, including driving for pleasure, hunting, and gathering forest products, such as fire wood, mushrooms, and berries. Forest visitors use a variety of motorized vehicles in the analysis area, including low clearance passenger vehicles, full size pick-ups, jeeps, ATVs, UTVs, and motorcycles. Non-motorized travel, including by foot, horseback, and bicycle occurs as well, but at lower levels. Non-motorized travel typically occurs on roads as they provide paths of less resistance in this area, which is characterized as steep, rugged, and brushy, making off road travel challenging.

3.7.6 Direct and Indirect Effects

3.7.6.1 Alternative 1

3.7.6.1.1 Recreation Opportunities

The Recreation Opportunity Spectrum would be unchanged.

The opportunity for driving for pleasure would remain the same; however, the quality of the driving experience may decrease due to changes in scenery and the potential for fallen trees on the road. People would venture into the burned area to see the fire's effects and to travel through to other forest areas. Recreation activities, such as mushroom gathering would likely increase for 3-5 years, and there would be a corresponding increase in traffic on roads and camping in dispersed sites and campgrounds. River use may increase associated with mushroom gathering as gatherers utilize water craft to access river-side burned areas in search of mushrooms. Firewood gathering would likely also increase as additional burned trees die. Firewood gatherers may create off-road routes with their motorized vehicles, although such activity is prohibited by the terms of Firewood Permits. Hunting for big game would likely decrease in the short-term as preferred forage species are reduced from pre-fire conditions. In the long-term, forage for big game may improve and thus opportunities for hunting may increase.

3.7.6.1.2 Developed Campgrounds

None of the identified developed recreation sites were affected by the fire and all would remain open and available, consistent with the funding and resources available. The forested areas seen from almost all of the sites would change over time, as previously described. The change in scenery would not likely affect use levels.

3.7.6.1.3 Dispersed Campsites

Use of dispersed sites, especially those located along Roads 223, 470, 653, 286, 1129, and US Highway 12 may increase with an increase in the gathering of mushroom and forest products. As a result, sanitation and encroachment (compaction, vegetation loss, crossings) near streams may become an issue requiring use restrictions.

3.7.6.1.4 Trails

The amount of trail opportunities would be unchanged. The Hot Point Trail would be cut out and erosion concerns addressed with BAER. Even after the BAER work, falling trees and snags would continue to be an issue for this trail for about 5 years. The other trails in the project area would continue to be maintained on an infrequent basis. Portions of Trails 716 and 712 were also affected by the Johnson Bar Fire and would see an increase in the number and frequency of fallen trees. Trail use would likely decrease due to numerous snags and the increased likelihood of falling trees on and across trails.

3.7.6.1.5 Roads

The amount of roads available for use would be unchanged. There would be increased road maintenance needs associated with falling trees and snags, which may affect unprepared travelers. Opportunities for non-motorized use of roads would also remain unchanged. However, individuals may choose to recreate in non-burned areas.

3.7.7 Alternatives 2, 3, and 4

The following direct and indirect effects are common to Alternatives 2, 3, and 4.

3.7.7.1.1 Recreation Opportunities

The recreation opportunity spectrum would be unchanged for all action alternatives.

Road decommissioning is being proposed under Alternatives 2, 3, and 4. These roads are distributed throughout the project area, but are concentrated in the areas defined as Roaded Natural and Semi-Primitive Motorized. The road decommissioning would not affect the mapping of Recreation Opportunity Spectrum categories. There are four individual road segments and all are currently closed to motorized vehicles, which is a primary factor in assigning ROS.

During project activities travel on roads adjacent to timber harvest activities and on haul routes would decrease either from self-selection for individuals in order to avoid those areas, or due to restrictions put in place to prohibit public use in order to protect public safety. Similar to the No Action Alternative, recreation activities, such as mushroom gathering, would likely increase for 3-5 years, which corresponds with the proposed timber harvest timelines. Mushroom hunters may be restricted from using some areas during timber harvest operations, which would decrease the amount of area available for these activities. Firewood gathering would be sharply curtailed as it is prohibited in active timber sale areas.

3.7.7.1.2 Developed Campgrounds

All developed recreation sites would be affected by increased traffic associated with mobilization of equipment, worker commutes, and timber hauling activities. Dust, noise, and traffic volume would be the primary influence to campers and developed site users. The toilets at Three Devils Picnic Area, Fenn Pond, and CCC Campground are easily accessible and visible from US Highway 12 and Road 223 and would see increased use associated with the timber sale commuter traffic. This increased use would not interfere with site users but would place a financial burden on the Recreation Program responsible for providing toilet paper, cleaning, and pumping the toilets.

O'Hara Campground, O'Hara Interpretive Site, and Lookout Butte are located on native surface and gravel roads that would be used for timber sale access and log hauling. Dust from these roads would likely increase from increased traffic and waft into the sites; thereby, negatively affecting visitor experiences. Dust abatement (required design criteria) near these sites would mitigate these concerns.

All of the developed sites are located within 300 feet of roads that would be used for timber sale access and log hauling. Visitors may experience decreased satisfaction with their recreation outing due to increased traffic noise and volume. The increase in traffic and noise would be less noticeable for sites along US Highway 12. The types of road noises that campers and visitors would experience would be similar to existing conditions but potentially louder and more frequent. The type of traffic would change from mostly passenger vehicles and recreational vehicles to include more commercial trucks, which could affect a visitor's sense of safety or security, especially for those areas that are immediately adjacent to the road or have little barrier between the road and the site, such as CCC Campground, Fenn Pond, and the O'Hara Interpretive Site.

3.7.7.1.3 Dispersed Campsites

All dispersed recreation sites would be affected by increased traffic associated with mobilization of equipment, worker commutes, and timber hauling. Dust, noise, and traffic volume would be the primary influence to dispersed site users. The effects to dispersed recreation site users would be identical to those described for developed site users, except dispersed site users may be even less tolerant because they are choosing to camp and recreate in an area that typically affords more solitude.

Three dispersed sites would be affected with proposed Helicopter landings H17, H18, and H19 would be utilized under Alternatives 2 and 3 and are located where dispersed campsites have been inventoried. H18 would not be used in Alternative 4; and therefore, only 2 dispersed sites would be affected. These sites would not be available for use during timber sale operations and would be physically changed following harvest activities. Impacts to future users could be mitigated with design criteria to restore the campsite following landing use. This would involve removing debris and assuring there is a reasonably flat area for camping similar to what existed prior to use.

3.7.7.1.4 Trails

In summary, harvest temporary road construction, swing trail use, and helicopter landings would affect 7.1 miles of trails in Alternative 2 and 6.3 miles in Alternatives 3 and 4.

The Hot Point Trail 706 would be directly affected by timber harvest Units 114, 115, and 116, temporary roads 114B, 114D, 114E, and 114F, and helicopter landing H9 (Alternative 3 would not utilize H9). All of these activities would occur on or over the trail, which would obliterate the trail for all practical purposes during harvest activities. There are design criteria for this trail to be identified as a protected improvement in the contract, which would restore the trail to pre-project conditions.

The Peterson Point Trail 712 would be directly affected by timber harvest in Units 131, 134, 137, and 143, temporary roads 131A, 131B, and 131C, and helicopter landing H22 (Alternative 3 would not utilize H22). All of these activities would occur on or over the trail, which would make about 4 miles of the 13-mile trail unusable for all practical purposes during harvest activities. There are design criteria for this trail to be identified as a protected improvement in the contract, which would restore the trail to pre-project conditions.

Effects to the Swiftwater Cross-cut Trail 716 vary by alternative and are described below under Alternative 3.

The Peterson Burn Trail 715 would not be directly affected by timber harvest activities or temporary roads. Helicopter landing H19 would be located at the eastern trailhead, where the trail joins Road 651. The trailhead might be avoided depending on site conditions and topography. There are design criteria for this trail to be identified as a protected improvement in the contract, which would restore the trailhead to pre-project conditions if it is affected.

There would be short-term impacts to potential users of all trails in the project area as trails would be closed to travel during harvest operations in order to protect public safety. Following harvest operations, trail prisms would be restored through harvest areas and access restored. Those portions of the trails that run through harvest areas would have a changed character, which may affect an individual's experience. The number of trees falling on the trails needing cut out would be substantially reduced from the No Action Alternative.

Snow Trail 286, from its junction with Road 470 west to the Forest Boundary, would be used as a haul route under all alternatives. If winter logging and hauling is authorized, this route would be plowed and unavailable as a groomed snowmobile trail. No alternate route exists and the groomed route may be affected for one to three consecutive years, depending upon contract progress and timing. The effects to snowmobile users could be reduced by providing an alternate winter parking area in the area of the Road 286 and 470 junction or Road 286 and 653 junction, depending on the actual haul routes being used. This would involve plowing snow to accommodate parking and turn-around for at least 5 truck-trailer combinations.

3.7.7.1.5 Roads

1.1 miles of system road or about 1% of the road system would be decommissioned. None of these roads are currently open for motorized use and there would be no loss of motorized recreation opportunities. The road decommissioning would result in lost opportunities for hikers, bikers, and horseback riders that use these routes.

4.8 miles of system road would be "stored" for future use. None of these miles are currently open for motorized use and there would be no loss of motorized recreation opportunities. The road templates would be retained and culverts may be removed and earth barriers may be placed at the beginning of each road. The roads would still be available for hikers, bikers, and horseback riders but stream crossings may be more difficult to traverse if culverts are removed.

3.7.8 Alternatives 2 and 3

In addition to the effects described as effects common to Alternatives 2, 3, and 4, Alternatives 2 and 3 would utilize Helicopter Landings H1 and H6 located at the Wild Goose

Campground and Johnson Bar Campground respectively and H18 located at Two Shadows. None of these helicopter landings would be utilized under Alternative 4.

River Related Recreation – Use of helicopter landings located in the river corridor could affect river related recreation such as floating, fishing, and general water play. Use of landings H1, H6, and H18 would be limited to November through April, avoiding the high use recreation times.

Wild Goose Campground – Helicopter Landing H1 would be located in the paved entrance and parking area of this campground. Use would be limited to a single season of use and to the months of November through April. The timing of use would avoid the high use recreation period and would occur when the campground would normally be closed. The direct effects to campers would be avoided with design criteria. Effects to the facility itself may occur and include damage to the paved surface and trees adjacent to the paved area. Both of these effects were experienced when this location was utilized as a helicopter landing in 2012 during the Interface Fuels Timber Sale. Design criteria require that the site be fully rehabilitated by May 15 of the year of use. Design criteria for rehabilitation of the site would address potential effects.

Johnson Bar Campground – Helicopter Landing H6 would be located in the reservable group use portion (center meadow area) of this campground. Use would be limited to a single season of use and limited to November through April. The timing of use would avoid the high use recreation period but because the entire campground would be closed during operations, campers would be directly affected since this campground is open year round. Effects to the facility itself may also occur and include damage to the group use area, access road, and vegetation near the access road. Design criteria require that the site be fully rehabilitated by May 15 of the year of use. Design criteria for rehabilitation of the site would address these potential effects. But the general character of the site may be altered with tree pruning/trimming along the access road.

Two Shadows Dispersed Site - Two Shadows is a large unpaved turnout adjacent to US Highway 12 at about MP 93 that is used for day use river access and occasionally overnight camping. Within 0.5 mile of this site there are 4 other inventoried dispersed sites. Use of the Two Shadows site would be limited to a single season of use and November through April. The timing of use would avoid the high use recreation period but individual users wishing to use the site may be affected. Design criteria require that the site be fully rehabilitated within 6 months of use, which would result in this site potentially not being available for use for an entire season.

The 4 dispersed sites located within 0.5 mile of Two Shadows would not be directly affected but would be affected by noise, making these sites less desirable while the Two Shadows landing is being actively used.

3.7.9 Alternative 3

Alternative 3 would not have the temporary roads and swing trails associated with Unit 114 that would affect Trail 716. Otherwise the effects of this alternative have been described above.

The Swiftwater Cross-Cut Trail 716 would be directly affected by timber harvest in Unit 114, but unlike Alternatives 2 and 4, Alternative 3 would not utilize additional temporary roads and swing trails that would directly affect the trail. There are design criteria for this trail to be identified as a protected improvement in the contract, which would restore the trail to pre-project conditions.

3.8 Soils

3.8.1 Analysis Area

The areas assessed for soils concerns are the individual treatment units (variable acres) and associated skid trails, landings, and temporary roads within the 26,800 acre project area.

3.8.2 Regulatory Framework

Forest Plan direction and the following Federal and State laws and regulations pertaining to the management of soil resources would be applied to the project:

- FSM 2500 Watershed and Air Management – Washington Office (WO) Amendments 2500-2010-1 and 2500-2010-2 and Northern Region (R1) Supplement 2500-14-1 (Regional Soil Quality Standards)
- Soil and Water Conservation Practices (SWCPs) Handbook - FSH 2509.22
- Idaho Forestry Best Management Practices (BMPs)
- Idaho Forest Practices Act (1974)
- National Forest Management Act of 1976 (NFMA) 16 USC 1604(g)(3)(i)
- 36 CFR 219.20

3.8.2.1 Consistency with Nez Perce National Forest Plan and Environmental Law

The Johnson Bar Fire Salvage project was designed to meet the standards set forth in the Idaho Forest Practices Act, FSM 2500 - Watershed and Air Management and Northern Region (R1) Supplement 2500-14-1 (Regional Soil Quality Standards), and FSH of Soil and Water Conservation Practices (FSH 2509.22).

The project complies with 36 CFR 219.20, which requires conservation and protection of soil and water resources and NFMA 16 USC 1604(g)(3)(E)(i), which states “Soil, slope or other watershed conditions would not be irreversibly damaged.”

Region 1 Soil Quality Standards found in FSM 2500 Supplement 2500-14-1 (USDA 2014) specify that at least 85% of an activity area (defined as a land area affected by a management activity) have soil that is in satisfactory condition. In other words, detrimental impacts (including past management impacts) shall be less than 15% of an activity area. In areas where less than 15% detrimental soil conditions exist from prior activities, the cumulative detrimental effect of the current activity following project implementation and restoration must not exceed 15%.

Nez Perce Forest Plan standards listed on page II-22 of the Forest Plan would also be met, including the Forest Plan amendment for the project (Table 3-29).

Table 3-29: Forest Plan Compliance

Standard Number	Subject Summary	Compliance Achieved By
1	Evaluate the potential for soil displacement, compaction, puddling, mass wasting, and surface soil erosion from ground-disturbing activities.	• Landtype identification and evaluation. • Field surveys or office evaluations were conducted on each of the proposed Activity Areas (units) for Regional standards.
2	A minimum of 80% of an Activity Area shall not be detrimentally compacted, displaced, or puddled upon completion of activities. This would be amended to follow R1 standard limiting DSD to 85%.	• Post-project monitoring to verify compliance and to assess if additional mitigation is needed. • Soil improvement activities on areas with prior impacts to achieve a net improvement in soil productivity.
3	Maintain sufficient ground cover to minimize rill erosion and sloughing on road cut and fill slopes and sheet erosion on other Activity Areas.	• Project design features were developed to minimize erosion. • Temporary road locations were. Unit-specific design measures were developed for high subsurface erosion areas.

3.8.3 Analysis Methodology

GIS generated reports and maps, aerial photos, and field reviews were used to analyze effects to the soil resource from the project's proposed activities. Field sampled vegetation database (FSVeg) queries were conducted to identify past harvest activities and their time frames (see project file). Field data was collected during the BAER assessment for the Johnson Bar fire. Information collected includes burn severity, soil texture, landslide prone, and hydrophobicity. After this initial field review, existing DSD was determined using lidar imagery in accordance with the Region 1 Approach to Soils NEPA analysis (UDSA 2011).

An erosion hazard assessment was used to summarize erosional characteristics based on landtype properties. This assessment described overall erosion hazards in the project area and at the unit scale to aid in the development of project design measures.

Potential soil restoration opportunities throughout the project area were assessed, with a focus on old skid trails, landings, and roads. Project design features describe methods for minimizing impacts to the soil and techniques for restoring soil biophysical integrity.

3.8.3.1 Data Assumption and Limitations

The methodology outlined in the Region 1 Approach to Soils NEPA Analysis Regarding Detrimental Soil Disturbance in Forested Areas (USDA 2011) and the Forest Soil Disturbance Protocol (USDA Forest Service 2009b) provides a conservative assessment of existing soil conditions (Page-Dumroese et al. 2006a), given its inherent assumptions (ocular data and soil pits).

Informal comparisons found that both for single observers and between observers, category calls in this methodology have a variability of 5%. This level of survey leads to a 90%–95%

confidence with error bars from 5% to 8%, depending on the amount of disturbance found. The surveys achieve statistical inference for units with either low disturbance (<7%) or moderately high disturbance (>23%) (Page-Dumroese *et al*. 2009).

Field soil survey methodology based on visual observations can produce variable results among observers, and the confidence of results is dependent on the number of observations made in an area (Page-Dumroese *et al*. 2006a). The existing and estimated values for DSD are not absolute and are best used to describe the existing soil condition. The calculation of the percentage of additional DSD from a given activity is an estimate, since DSD is a combination of such factors as existing ground cover, soil texture, timing of operations, equipment used, skill of the equipment operator, the amount of wood to be removed, and sale administration. The DSD estimates for proposed project activities are mostly based on local monitoring and research results (Archer 2008; Reeves et al. 2011). The DSD estimates of proposed activities also assume that BMPs would be implemented and that soil recovery occurs over time.

3.8.3.2 Scientific Uncertainty and Controversy

Site and soil productivity relies on complex chemical, physical, and climatic factors that interact within a biological framework. For any given site and soil, a change in a key soil variable (e.g., bulk density, soil loss, and nutrient availability) can lead to changes in potential soil productivity. Defining the threshold at which productivity is detrimentally disturbed is controversial. The rationale for the 15% limit of change in soil bulk density was largely based on the collective judgment of soil researchers, academics, and field practitioners, and the accepted inability to detect changes in productivity less than 15% using current monitoring methods (Powers 1990). Powers (1990) states that the soil quality guidelines are set to detect a decline in potential productivity of at least 15%. This statement does not mean that the Forest Service tolerates productivity declines at this level, but that it recognizes problems with detection limits.

Soil quality standards are being studied by a cooperative research project called the North American Long-Term Soil Productivity Study (LTSP). The 5- and 10-year results were recently published (Page-Dumroese et al. 2006b; Fleming et al. 2006; Sanchez et al. 2006). The LTSP study is ongoing and provides the best available science to resource professionals. In a 10-year study, no observed reduction in tree growth occurred as a result of compaction or organic matter removal in plots with soils generally similar to those found in the project area (silt loam) (Powers et al. 2005). These results are relatively short-term and involve many site- and soil-specific factors. Future results from the ongoing study should be helpful for assessing harvest practices on soil productivity.

Additional controversy surrounds the use of the term “irreversible” in the NFMA. The NFMA has guidelines that “insure that timber would be harvested from NFS lands only where soil, slope, or other watershed conditions would not be irreversibly damaged.” The DSD described in this analysis does not necessarily result in substantial and permanent impairment.

DSD is reversible if the processes (organic matter accumulation, moisture, topsoil retention, and soil biota) are in place and if time is allowed for recovery. Irreversible damage to soils in the project area could result from the loss of the volcanic ash cap through erosion or removal by excavation for temporary roads and/or skid trails. Soil recovery could still occur in remaining subsurface soils, yet the exceptionally high porosity and water-holding properties of the Mazama ash cap would likely be irrecoverable.

3.8.4 Resource Indicators

Soil Stability and Erosion Hazard Potential - Soil erosion can result in loss of soil productivity due to surface soils moving downslope and thus removing the materials with the greatest ability to hold moisture and nutrients. Compared to the subsurface soils, surface soils in the project area contain more organic matter and have a higher volcanic ash-derived mineral content. Removal of vegetation and/or ground disturbance associated with timber harvest or fire can increase erosion on certain landtypes.

Indicator: Acres of proposed skid trail/landings and miles of proposed temporary roads on landtypes with a high erosion hazard – surface, subsurface, and mass wasting.

Soil Productivity - Past management activities in the project area have caused Detrimental Soil Disturbance (DSD) and decreased soil productivity. According to the Region 1 Soil Quality Standards, detrimental disturbance (e.g., compaction, displacement, erosion, loss of organic matter) from management activities should not exceed 15% of an Activity Area and coarse woody material retention should be appropriate to the habitat type.

Indicator: Number of commercial harvest units requiring specialized project design measures to meet Regional soil standards.

Table 3-30: Resource Indicators by Alternative

Resource Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Miles of temporary road or swing trail construction on soil rated as high hazard for erosion and needing project design measures	0	4.9	0.8	5.4
Acres of harvest on terrain rated as high hazard for erosion and needing project design measures	0	2,585	2,243	2,000
Number of harvest units requiring specialized project design measures to meet Regional soil standards	0	0	0	0

3.8.5 Affected Environment

3.8.5.1 Landforms and Geology

Soil characteristics in the project area vary according to slope gradient, slope aspect, parent material, texture, depth, vegetative cover, and microclimate. Landforms in the project area are mostly dissected stream and mountain breaklands (70%), low- and moderate-relief rolling uplands (11%), and landslide deposits (11%).

The geologic substrate is primarily Belt Zone and Border Zone metamorphics (95%), followed by Alluvial deposits (3%), Idaho Batholith Border Zone granitics (1%) and Columbia River basalt (1%). Soil parent material is primarily granitic (84%), with colluvium of various types (11%) and basalt (2%). Surface soils are generally silty or sandy loams. The coarse fragment content in the soils is very low, generally less than 35%, increasing the susceptibility of the soil to compaction and rutting from ground-based machine harvesting.

Much of the area is overlain by a mixed to intact layer of Mazama volcanic ash, ranging from 8 to 12 inches in thickness. The ash cap is thin or missing in the steeper breaklands (0 to 6 inches). Ash material is physically highly favorable to root growth, being very permeable and possessing a high ability to hold moisture and nutrients. Its presence as an intact layer with little mixing is an indication of relatively stable slopes over the past 6,700 years since the ash deposition.

3.8.5.2 Landslide and Erosion Hazard Potential

Landtypes are ecological land units categorized by similarities in soils, landforms, geologic substrate, geomorphic processes, and plant associations (Cleland et al. 1997). These land units have been mapped for the entire Nez Perce National Forest. Landtypes were identified for the project area to help focus field evaluations and to pinpoint any erosion hazard concerns.

Landslides are the dominate natural erosion process in the project area. Landslide-prone (LSP) areas mapped on the Nez Perce National Forest are located on slopes over 60% and landtypes 50EUU and 50CUU. Areas considered highly prone to landslides comprise approximately 27% of the project area. LSP was further refined for the Johnson Bar project area based on a combination of lidar analysis and field verification. All areas identified as LSP have been excluded from proposed activities.

3.8.5.3 Soil Productivity

Soils in the project area are generally silt loams, formed from loess and overlain with a shallow to moderately deep volcanic ash layer. Past natural and management activities have impacted the productivity of these soils.

Field data was collected in 2014 during the Burned Area Emergency Response (BAER) assessment for the Johnson Bar fire. Burn severity maps were produced and field-verified as part of the BAER assessment for the Johnson Bar fire (USDA, 2014). Burn severity is defined through differences in surface organics, duff cover, and characteristics of mineral soils (Debano et al, 1998):

- Low severity – low soil heating, litter scorch or consumption with duff largely intact, mineral soil is not changed.
- Moderate severity – litter consumption with moderately charred or consumed duff, no visible alteration of mineral soil surface.
- High severity – complete consumption of duff and mineral soil surface visibly reddish or orange color.

Information collected includes burn severity, soil texture, landslide prone, and hydrophobicity. Burn severity maps were created following the Johnson Bar fire. The following table describes the amount of unburned areas and the extent of low to high burn severity.

Table 3-31: Burn Severity by Harvest Unit

Unit Number	Acres	Acres of Past Harvest	Burn Severity (%)			
			Unburned	Low	Mod	High
101	83		31	56	13	
102	101		5	30	64	
103	221	8	13	47	40	1
104	138	11	14	48	37	
105	26	16	20	45	36	
106	61		40	41	19	
107	11		38	56	6	
108	4		35	37	28	
109	13		4	42	53	
110	49	10	16	52	32	
111	173	20	17	42	42	
112	3		2	23	75	
113	16		27	17	56	
114	150	75	83	14	3	
115	153	93	6	7	60	27
116	276			7	48	44
117	52	3	4	14	80	2
118	10		4	28	68	
119	24		1	2	90	7
120	17	4		25	74	1
121	28		3	16	81	
122	219		5	23	68	3
123	12			9	91	1
124	6			28	72	
125	108		1	16	81	2
126	102		7	37	52	4
127	42		9	49	41	
128	36		21	18	43	18

Unit Number	Acres	Acres of Past Harvest	Burn Severity (%)			
			Unburned	Low	Mod	High
129	123		3	13	73	11
130	2		46	54		
131	144		4	29	60	7
132	26		5	28	67	
133	15		4	41	55	
134	18		51	26	23	
135	67		68	22	10	
136	25	5	8	52	41	
137	27		19	68	13	
138	44	2	14	70	16	
139	49	50	18	55	27	
140	22	12	7	28	65	
142	39		12	73	15	
143	46	3	26	70	4	
144	93		29	63	8	
145	98		8	64	27	

After this initial field review, existing DSD was determined using lidar imagery in accordance with the Region 1 Approach to Soils NEPA analysis (UDSA 2011). Existing detrimental soil conditions within the units range from 0% to 6% (see project file). Soil disturbances found during the surveys included old skid trails and landings in the form of soil displacement, rutting, and compaction.

Although not specifically addressed by a Forest Plan standard, the presence of above-ground organic matter or woody material is an important component of soil health. The retention of coarse (>3 inches in diameter) woody material is essential to maintaining soil productivity (Graham et al. 1994). Regional direction (Forest Service Manual) for organic material recommends following guidelines such as those contained in Graham et al. (1994) if more-specific local guidelines have not been developed. Graham et al. (1994) recommend 7–33 tons/acre of coarse woody material (depending on habitat type, moisture regime, and aspect). This amount should provide sufficient organic material for soil productivity in the long term (100–300 years). Retaining existing coarse wood levels and allowing for recruitment through the natural addition of snags and/or standing trees would facilitate these benefits. Existing down woody material averages about 20 tons/acre in units proposed for project activities (visual observation). Litter and duff layers throughout the project area average 0 to 6 centimeters in depth. In areas of moderate to high burn severity, litter and duff was completely consumed; in low burn severity areas, litter/duff layers average 2 to 4 centimeters; and in unburned areas, duff/litter layers are approximately 4 to 6 centimeters deep.

3.8.6 Direct and Indirect Effects

The analysis area for direct and indirect effects of the alternatives is the individual treatment units (variable acres) and associated skid trails, landings, and temporary roads within the 26,800 acre project area.

3.8.6.1 Alternative 1

This alternative maintains the existing condition resulting from the Johnson Bar fire. Alternative 1 would not alter the current soil erosion or landslide potential and would retain the same amount of coarse woody material, both standing and down. Existing DSD would persist with very slight natural recovery of surface layers of compacted soils. Over time, large woody debris from dead trees would fall on the ground, increasing organic matter and water-holding capacities on-site.

Under Alternative 1, no road decommissioning activities would occur that would directly improve soil conditions by decompacting soils and adding coarse woody material and other organic matter to the existing road surface. Soils in these areas would remain in a less productive condition.

3.8.6.2 Alternatives 2, 3, and 4

Landslide and Erosion Hazard Potential

The project area has been mapped and divided into landtypes (areas featuring similar soils, hydrology, and vegetation characteristics). Soil erosion and mass wasting are natural processes, and many landtypes across the Forest have high inherent hazards of erosion, mass wasting, and landslides (NRCS 2006). These natural processes have occurred over long time periods and are fundamental factors in creating the present-day landscape.

Landslide-prone (LSP) areas were identified using GIS and lidar analysis. All potential landslide prone areas were excluded from the salvage harvest units. If additional landslide prone areas are identified, the area would be excluded from harvest and a PACFISH buffer would be added. **No harvest activities would occur in these areas.** Indicators of landslide prone areas include: steep (over 60%) concave slopes; hydrophytic vegetation (i.e. sedges, moist site ferns); slumps, draws, and basins; past landslide locations; and obvious soil movement areas (typically indicated by curved and/or buttressed tree boles, soil creep, tension cracks, etc.).

An erosion hazard assessment based on landtype properties was used to determine erosional characteristics of the project units and temporary roads/swing trails. This assessment was used to develop project design measures to minimize erosion potential. Mass wasting, surface erosion, and subsurface soil erosion potentials were evaluated for the landtypes coinciding within the proposed harvest and burn units (see project file for detailed information on individual units.)

Surface erosion was rated as high on 148 acres (5%) of proposed units. Approximately 41% of the landtypes located in the proposed units are considered as high mass wasting potential and 87% of units are located on landtypes considered high for subsurface erosion. Generally, logging in areas with high risk for subsurface erosion is problematic only if the surface soil is removed and the subsurface and parent material is exposed – such as excavated skid trails and landings. Based on past monitoring on the Clearwater Forest, an estimated average 10% of areas using ground-based logging systems are detrimentally disturbed. Using this assumption and the fact that tractor logging is proposed on 202 acres under Alternatives 2 and 4 with 8 acres under Alternative 3, approximately 0 to 20 acres would be utilized for skid trails and landings on areas with high subsurface or mass wasting erosion potential.

Landtype erosion hazards used to assess the effects of the alternatives on soil stability and erosion potentials indicate an overall increase of erosion potential for each of the action alternatives. Surface soil loss through displacement and mixing with infertile substrata has long-lasting consequences for soil productivity. This loss occurs during temporary road construction, excavation of skid trails and landings, and displacement of soils during ground-based harvest. Irreversible damage to soils could result from the loss of the volcanic ash cap. Although soil recovery could still occur in remaining subsurface soils, the exceptionally high porosity and water-holding properties of the Mazama ash cap would likely be irrecoverable. Even though the ash layer is not a significant source of soil nutrient content, loss of the ash layer reduces water-holding capacity and high-quality tree rooting material. Since volcanic ash is not easily replaced, these effects may be very long lasting. Skid trails and landings would be located and designated to minimize the area of soil disturbance.

Design measures to reduce the potential for erosion include the following: limiting the amount of excavated skid trails and landings; fully decommissioning all excavated skid trails and landings on erosive landtypes; and placing large, woody material over the contoured slope for soil stabilization. See the design criteria for soils in Chapter 2 for a complete list of measures.

Less than 200 feet of proposed swing trail is proposed on landtypes rated as high for potential surface erosion in Alternatives 2 and 4, with none in Alternative 3. Approximately 0.5 miles of proposed temporary road and swing trails would be located on landtypes rated as high for mass wasting potential, with only 0.1 miles proposed in Alternative 3. For Alternative 2, approximately 4.9 miles of proposed temporary roads and swing trails are located on landtypes with high subsurface erosion potential, with approximately 0.8 miles in Alternative 3, and 5.4 miles in Alternative 4. Location on these landtypes is often only problematic if the surface soil is removed and the subsurface material is exposed.

The proposed temporary roads would be located on ridgetops and upper slopes, and only short, discontinuous portions would require some form of excavation. All temporary roads would be decommissioned after use, and large woody material (>3 inches in diameter) would be placed on the surface to aid in soil stability. An increased number of water bars or the addition of slash material to the road bed would be used as necessary to reduce erosion while the road is in use. Even if small segments in these roads cut into the subsurface material and some erosion does occur, the likelihood of sediment delivery to streams would be minimal, because temporary roads would be located on ridgetops far from stream channels.

Soil Productivity

Compaction, displacement, rutting, severe burning, surface erosion, loss of surface organic matter, and soil mass movements can all reduce site productivity. For the purpose of the project, proposed harvest units, temporary roads, and prescribed burn units are all considered Activity Areas.

Much research has been conducted on the extent of ground disturbance from harvest activities. Disturbance has been shown to range from 4% to over 40%, depending on equipment used, method and season of operation, and silvicultural prescription (Clayton 1981; Clayton 1990; McNeeland Ballard 1992; Tepp 2002). Megahan (1980) documented that the highest amount of disturbance came from tractor yarding, with lesser amounts from skyline and aerial methods. In order to estimate the potential increase in detrimental disturbance created by proposed activities, the following assumptions were made for ground-based skidding, skyline yarding, temporary road construction, and slash treatment:

- Detrimental soil impacts from proposed ground-based skidding are estimated at 8%–12% (average 10%) of an Activity Area based on use of designated skid trails (Archer 2008). Detrimental soil disturbance is generally limited to main skid trails and landings. Soil disturbance can be minimized by using existing skid trails and/or by designating the locations of new skid trails (Froehlich and Adams 1984; Froehlich and McNabb 1983).
- Estimated detrimental soil impacts from proposed skyline yarding are 4% of an Activity Area, and disturbance is mostly concentrated at landings.
- Estimated detrimental soil impacts from proposed helicopter yarding are 2% of an Activity Area, and disturbance is mostly concentrated at landings.
- Impacts to soil from temporary road construction are expected to span an average width of 25 feet wherever roads are built. This estimate is based on the assumption of a running road surface 12–15 feet wide and an additional 3–6 feet, cleared of vegetation, on each side of the road, where the soil would likely be displaced and the organic litter layer disturbed and/or removed. Based on these estimates, temporary roads would increase DSD by less than 1% for any activity unit. Swing trails would have essentially the same effects as temporary roads, due to the extent of soil disturbance and were analyzed the similarly.
- Activity-generated slash piled along roadsides and in landings would be dispatched via sale of biomass materials, chipping, or burning. Activity generated slash would be hand piled and jackpot burned if needed. Treatment of slash is incorporated in the estimated DSD discussed above.

The calculations based on the above assumptions are gross estimations and are best used to compare alternatives and develop design criteria for units that may have particular concern.

Based on the above DSD assumptions, the proposed activities could cause soil disturbance on approximately 111 acres for Alternative 2, approximately 75 acres for Alternative 3, and approximately 99 acres for Alternative 4, with the estimated increase of DSD in the harvest units ranging between 2% and 8% (see project file). The estimated increase includes skid trails, landings, swing trails and temporary roads that would be obliterated after project activities, so some measure of improvement would occur on those areas. The area of increased DSD is less than 1% of the 26,800 acre project area for all action alternatives. The highest percent increase in soil disturbance occurs in units with proposed ground-based yarding methods. Some of these units have existing skid trails and landings that could be reused, thus minimizing the amount of new detrimental disturbance.

Implementation of project design measures and BMPs would minimize DSD, and the decommissioning of skid trails, landings, and temporary roads would further improve soil condition. Decommissioning activities include decompaction, recontouring, adding organic matter, and seeding/planting. Soil remediation improves water infiltration, reduces potential for weed invasion, stabilizes slopes, and improves tree growth and vegetation establishment.

3.8.7 Effectiveness of Design Criteria

Past monitoring and research indicate that the effectiveness of the project design features would be moderate to high (Froehlich and McNabb 1983; Graham et al. 1994; Graham et al. 1999; Korband Covington 2004; Neary et al. 2008; Curran et al. 2005a, b).

3.9 Vegetation

3.9.1 Analysis Area

The analysis area for this assessment includes 26,788 acres of National Forest Service managed lands, portions of which are in the upper portion of the Clearwater River subbasin and portions are in the lower Selway River subbasin.

3.9.2 Regulatory Framework

Forest Plan direction and all federal and State laws and regulations pertaining to the management of vegetative resources on the Forest would be applied to the project, including the NFMA of 1976. In addition, diagnosis, prescription development, and forest health analysis are guided by Forest Service regulations and policy (FSH 1909.60 and 2409.17; FSM 1920, 2020, 2470, 2471, and 2472) and the Region 1 Integrated Restoration and Protection Strategy.

3.9.2.1 Nez Perce National Forest Plan

3.9.2.1.1 Timber Standards

Timber Standard 1: Require silvicultural examination and prescriptions before any vegetative manipulation takes place on forested lands. Final determination of the silvicultural system for areas to be harvested would be made by a certified silviculturist after an on-the-ground, site-specific analysis.

All proposed treatment stands would have been examined on the ground by a silviculturist, wildlife biologist, and fuels specialist. All vegetative treatments would have silvicultural prescriptions approved by a certified silviculturist prior to treatment implementation. Prescriptions would consider site-specific factors as well as multiple resource objectives, NEPA decisions, other regulatory requirements and Forest Plan goals, objectives, and standards. Action alternative treatments were proposed because they balance the management, operational, soil disturbance, and human dimension requirements and respond to the purpose and need.

Timber Standard 2: Clear-cutting would not occur adjacent to previously harvested areas that are still considered openings.

No harvest is being proposed adjacent to stands that would be considered an opening. All proposed harvest units that are adjacent to previously harvested stands are certified as fully stocked, and the trees are greater than 10 feet in height.

Timber Standard 3: Permit timber harvest on lands classified as “unsuitable” for timber management to accomplish multiple use objectives.

No harvest is being proposed on unsuitable lands.

3.9.2.1.2 Protection Standards

Protection Standard 3: Minimize the impacts of the mountain pine beetle and other insect and disease infestations to the extent necessary to achieve the overall goals and objectives of this Forest Plan.

Loss of the long-lived early seral components in the ecosystem is a major factor in the lack of ecological resiliency. Salvage and planting treatments would remove dead timber and high fuel volumes, which would trend the project area toward species compositions with increased resilience. Proposed treatments would promote Forest resistance to disturbance agents while promoting Forest resiliency.

3.9.2.2 National Forest Management Act

Vegetation Manipulation [36 CFR 219.27(b)(1)]): Ensure that technology and knowledge exist to adequately restock lands within 5 years after final harvest.

Restocking within 5 years of regeneration harvest is a required design item of the action alternatives. Technology and knowledge do exist to comply with this requirement. This standard is met under the action alternatives.

Silvicultural Practices [36 CFR 219.27(c)]: No timber harvest, other than salvage sales or sales to protect other multiple-use values, shall occur on lands not suitable for timber production.

Guidelines for determining suitability are found in the FSH (2409.13). The proposed harvest units are within the productive habitat types as described in Cooper, Neiman and Roberts,

1991. None of the areas being proposed for treatment as part of the project are designated as unsuitable under the 1987 Forest Plan (USDA Forest Service 1987b). This standard is met under the action alternatives.

Salvage Operations [36 CFR 219.11(4) iii]: The planned maximum size for openings to be cut in one harvest operation shall not apply to the size of openings harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm [16 U.S.C. 1604(g)(3)(F)(iv)].

3.9.2.3 Forest Service Manual 2471 – Harvest Cutting

The size of harvest openings created by even-aged silvicultural systems in the Northern Region would normally be 40 acres or less. Creation of larger openings would require 60-day public review and Regional Forester approval.

The public was informed during scoping that regeneration openings in excess of 40 acres were proposed for the project area. Approval to exceed the 40-acre opening size, with appropriate interdisciplinary analysis and documentation, was received from the Regional Forester‘s office on October 24, 2014. The action alternatives would create openings on the landscape that are closer in scale and pattern to the openings developed under historic disturbance regimes for this area. This standard is met under all the action alternatives.

3.9.3 Analysis Methodology

The analysis of effects on forest vegetation resources is based on the following information:

- Best Available Science;
- Review of pertinent scientific literature related to the ecology, fire, insects, disease, reforestation;
- Review of pertinent silvicultural practices for managing timber;
- Geographical Information Systems data available from Nez Perce-Clearwater National Forest databases;
- Collective and professional knowledge of the project area by the Interdisciplinary Team regarding proposed silvicultural practices and the patterns and processes of forest vegetation within the project area;
- Review of Forest Plan for timber resources;
- Review of applicable law and regulations; and
- Modeling using the Forest Vegetation Simulator.

3.9.4 Resource Indicators

No single indicator is a definitive measure of forest health or resilience. A healthy forest ecosystem is characterized by absence of pathogens and organisms at epidemic levels (Tappeiner, Maguire and Harrington, 2007). In healthy Forests the agents of change like pathogens, organisms, wildfire, and wind events do not threaten management objectives now or in the future. Healthy forests are resilient to the agents of change and anthropogenic disturbances (Edmonds, Agee and Gara, 2005). A healthy forest is sustainable and can meet current and future management objectives.

Early seral stand component as it relates to forest health is the analysis indicator that would be discussed at a project level. Vegetation response units (VRU) were used to describe the biophysical environment and to provide appropriate context for analyzing Johnson Bar conditions. Agents of change—such as succession, weather, climate, fire, insects, and disease—are also considered in these discussions.

This project would modify the disturbance of the Johnson Bar Fire of 2014 by removing dead heavy fuels and restoring early seral species by planting western larch, western white pine and some ponderosa pine. Analysis of the action alternatives would be based on the stand composition. To account for variation of fire mortality 60% and 100% were used as a basis for analysis because stands below 50% mortality would not be harvested. The salvage treatment alternatives would be compared to the No Action alternative on the basis of a 60% and 100% fire mortality rate. The matrix for comparing stand composition would be:

1) No Action alternative with 60% fire mortality to salvaging and planting treatments with 60% mortality.
2) No Action alternative with 100% fire mortality to salvaging and planting with 100% fire mortality.

Current conditions for these indicators were derived from legacy data Timber Stand Management and Records System (TSMRS), FSVeg data, and using the forest vegetation simulator (FVS) model.

The effectiveness of the alternatives in addressing forest composition objectives is indicated by the following:

- Percent of the project area with forest cover type dominated by the long-lived early seral species (western white pine, western larch, and ponderosa pine) compared to area dominated by grand fir western red cedar and Douglas-fir.

This analysis relies on the comparison of existing conditions for western red cedar, grand fir, and Douglas fir to the percent of early seral species which are more resistant to fire, strong winds and root rot. Stand conditions were compared under the no action alternative and the three action alternatives over 85 years (2102).

Existing conditions reflect past natural disturbances and management activities. The interaction of successional development and disturbances such as fire, insects, diseases, and human influences results in the species composition, structure, and landscape arrangement of an ecosystem.

The vegetative desired condition for the project area was developed prior to any proposed action or effects analysis. It is based on multiple resource objectives, using direction from the 1987 Forest Plan (USDA Forest Service 1987b), the proposed 2008 Plan Revision, and the Selway Middle Fork Clearwater Sub-basin Assessment.

3.9.5 Affected Environment

3.9.5.1 Biophysical Environment

Much of the vegetation in the Nez Perce-Clearwater National Forests is a result of the productive ash cap soils and the prevailing climatic pattern. The climate is dominated by Pacific maritime air masses and prevailing westerly winds. Within the analysis area, annual precipitation varies from 40 to 50 inches. Over 90% of the annual precipitation occurs during fall, winter, and spring months as a result of cyclonic storms in the form of a series of frontal systems moving east. The elevation of the analysis area ranges from 2,000 to 6,600 feet.

3.9.5.2 Ecological Setting and Vegetation Response Units

Bailey's ecosections were used to summarize historic vegetation information (McNab and Avers 1994). Each ecosection contains broad vegetation and topographic conditions. Local landtype classifications were used to divide each section into three settings. There are two primary settings within the analysis area; the Idaho Batholith Breaklands, and the Idaho Batholith Uplands. Incorporated within each of the resulting settings are five VRUs, as shown in Table 3-32. Two of these VRUs are in the project area, but have no treatment areas, while the other three VRUs have treatment areas within them. These units are broad ecological land sections that contain habitat type groups and terrain that have similar patterns of disturbance and successional processes. Patterns of plant community composition, age class structure, and patch size tend to fall within certain ranges for each VRU. The components used to build the VRU classification system are habitat type groups (potential vegetation), landforms, climate, and pre-settlement disturbance processes (such as fire regimes). The desired conditions, potential natural vegetation that could occupy the project area following a disturbance, successional patterns and stand development are presented below. The VRUs would be discussed in the analysis in terms of cover types and habitat types. Since very little to no treatment are in VRU 3 and VRU 7 no detailed description of them would be presented.

Table 3-32: Vegetation Response Units in the Project Area

VRU Number	VRU Acres in Project Area
VRU 3	327
VRU 7	5
VRU 8	19,596
VRU 10	2,999
VRU 17	3,861
Totals	26,788

ECOLOGICAL SETTING: IDAHO BATHOLITH—BREAKLANDS

The Breaklands are characterized by low- to mid-elevation canyons on steep south aspects. The Breaklands setting is dominated by steep slopes and deep canyon walls through which the Middle Fork and Selway tributaries flow. Soils are derived from granite, border zone, and basalt geologies. Landslides and surface creep are the dominant erosion processes. The Breaklands are known for having inclusions of landslide prone areas and shallow soils. These characteristics make this setting more susceptible to erosion and more sensitive to disturbance.

Wildfire was the primary process affecting plant succession, composition, and distribution. Steep terrain favors rapid, upslope spread of wildfires. Stand-replacing fires are more prevalent on long, steep slopes and less frequent in adjoining moist habitats. Patches on dry aspects are uneven-aged, resulting from nonlethal to mixed-severity wildfire. Patches on moist aspects are even-aged, with uniform vegetation and fuel conditions resulting from stand-replacing fires. Early seral species (shrubs, forbs, and grasses), Douglas-fir, ponderosa pine, and grand fir readily reestablish following wildfire episodes.

VRU 8: 19,596 ACRES (74% OF THE ANALYSIS AREA)

In VRU 8 the ecological parameters vary dependent upon successional stages, such as stand initiation, mid-seral, and late successional. Grand Fir, Douglas-fir, and western redcedar dominate stands in VRU 8 during late successional stages. Early seral stages range from relatively open to densely stocked and are usually dominated by a mix of early seral and mid-seral species, including lodgepole pine, western larch, and western white pine. Ponderosa pine, Engelmann spruce, and Pacific yew may be present. Important elements include coastal disjunct plant species, early to seral tall shrub and hardwood communities, and old-growth inclusions of western redcedar riparian habitats. Patch sizes are widely variable and result from irregular, infrequent mixed-severity fires and very infrequent stand-replacing fires throughout the landscape. Old-forest habitats dominated by shade-tolerant conifers typically occur in patches of <40 acres and are associated with topographic inclusions (benches, basins, flat ridges, and moist habitats). These smaller patches are a result of stand-replacing fires. About 50%–60% of stands originate from stand-replacing fires. Post disturbance stands include at least 10 live trees per acre (TPA) that are >150 years old. Relict Douglas-fir, western larch, grand fir, and ponderosa pine are common on ridges.

ECOLOGICAL SETTING: IDAHO BATHOLITH—UPLANDS

The Uplands setting is a mix of gentle-to-steep slopes that form shallow canyons. Surface soils are derived from granite, border zone, and basalt geologies. The warm, moist climate, in combination with deep volcanic ash soils, creates high site productivity for forested stands. Surface creep is the dominant erosion process; mass-wasted areas are local and uncommon.

Fire was the primary landscape disturbance process affecting plant succession, composition, and distribution. The fire regime is variable due to irregular terrain that discourages rapid fire spread. This fire regime creates a mosaic of mixed- to lethal-burned uplands and nonlethal or unburned riparian habitats. Small openings created by the more frequent low- and mixed-severity fires result in a mix of tree species and ages. Stand-replacing wildfire occurs at intervals of 150–250 years or more (Kapler-Smith and Fischer 1997) and is likely associated with strong wind episodes in combination with extended drought.

VRU 10: 2,999 ACRES (11% OF THE ANALYSIS AREA)

In VRU 10 the ecological parameters vary dependent upon successional stages, such as stand initiation, mid-seral, and late successional. The dominant stand structure and cover types in VRU 10 are open-canopied, multi-aged old-forest stands of grand fir, Engelmann spruce, subalpine fir, western redcedar, and Sitka alder. Isolated Douglas-fir, western larch, lodgepole pine, and Pacific yew locally occur on ridges. Mixed alder, forbs, and grasses are well distributed and persistent as inclusions. Multi-aged, mixed-species stands originate from low- and mixed-severity disturbances, including windthrow. Old-forest habitats are dominated by shade-tolerant conifers associated with moist habitats.

VRU 17: 3,861 ACRES (14% OF THE ANALYSIS AREA)

In VRU 17 the ecological parameters vary dependent upon successional stages, such as stand initiation, mid-seral, and late successional. Mature stands in VRU 17 are dominated by western redcedar and Grand Fir forest cover types in the absence of disturbance. With stand re-initiation, Douglas-fir, western white pine, and western larch occur as isolated relics in mature and old stands. The decline in white pine has led to the increase of grand fir and Douglas-fir, which have a high susceptibility to root diseases. Open-canopied, multi-aged old forest and tall shrub communities are important elements. About 40%–60% of stands evolve with mixed-severity disturbances, and 40%–60% develop following stand-replacing disturbances. Post disturbance stands include at least 10 live trees/acre that are >150 years old. Old-forest habitats are dominated by shade-tolerant western red cedar and grand fir.

The Nez Perce-Clearwater National Forest is effectively managing an estimated 12% of the National Forest for timber products. Current forest land allocations are shown in Table 3-33.

Table 3-33: Nez Perce - Clearwater National Forest Land Allocations

	Acres within Nez Perce-Clearwater National Forest Lands	Percent of Forest Lands (4,072,799)	Acres within Forest Timbered	Percent of Forest Covered in Timber (3,368,613)
Nez Perce/Clearwater	4,072,799	100%	--	--
USFS Timbered	3,368,613	83%	3,368,613	100%
Roadless	1,570,184	39%	1,301,829	39%
Wilderness	1,203,350	30%	796,932	24%
RHCA in Roadless	327,615	8%	287,071	8%
RHCA in Wilderness	210,795	5%	164,057	5%
RHCA not Roadless / Wilderness	400,357	10%	285,711	9%
RHCA Total	938,767	23%	736,839	22%
Total Timbered Allowed for Harvest	495,659	12%	495,657	15%
* Discrepancies in acres are due to GIS operations and rounding.				

Fire suppression and the lack of stand density management, or stocking management, has allowed most of the project area to reach climax species of Grand Fir (GF) and western red cedar (WRC) as shown in Table 3-34. Although most stands have reached the late successional stage they have not reached the old growth stage. The Johnson Bar fire was the most recent natural event to change stand conditions. The Johnson Bar fire was a mixed severity fire in a young climax species forest.

Table 3-34: Project Area Cover Types

Cover Type	No Treatment in Project area	Percent of Cover Type in Johnson Bar Fire Salvage project
Aspen	19	0%
Birch - Green Ash, Boxelder, Red alder	83	0%
Subalpine Fir - Spruce	39	0%
Western Red Cedar	8,353	31%
Grand Fir	7,370	28%
Douglas-fir	4,361	16%
Ponderosa Pine	38	0%
Lodgepole Pine	102	0%
Non Forest	35	0%
Unkown	9,388	35%

3.9.5.3 Forest Composition

Forest cover types describe the dominant tree species present in a stand. The forest cover types in the project area are primarily late successional mixed conifers that have not achieved old growth age or structure (Table 3-34). The Uplands and the Breaklands have relic, long-lived early seral species (western larch and ponderosa pine) but are primarily composed of late-seral, shade-tolerant species. Previously harvested units were planted with western white pine, western larch and ponderosa pine in the project area. The presence of long-lived early seral components can be used as an indicator of forest health. Early seral species and their composition, structure, and functions have the desired resistance, and resilience to recover from disturbances. Resistance is defined as the ability for a stand to prevent negative impacts from disturbance agents and protect valued resources. Resilience is defined as the capacity of ecosystem to return to desired conditions after disturbance.

3.9.5.4 Desired Stand Conditions

Stands are desired to be resistant to strong winds, fire, insects and disease. Trees should be vigorously growing as indicated by long leader growth, deep green needle color, long needle length, full crowns and the color of bark (Sherlock, 2007)(Keen, 1940). Early seral species are desired because they are more resistant to root rots (Trip Report CFO-TR-08-24, 2008). Desired stand conditions are shown in Table 3-35. Stand densities are desired to be over 35% maximum stand density index (SDI) stocking and less than 55% maximum stand density index stocking. Reaching these goals may take time due to the fire severity and the time it takes for trees to grow to reach desired conditions.

When the project is completed there should be 300-400 seedlings per acre of early seral species like western larch, western white pine and ponderosa pine. There should be 17-28 live or dead leave trees per acre. There should be 17-28 tons of fuel on the ground to provide wildlife habitat and to develop productive soils. 5-10 tons of fuel should be in the 3-12 inch size class and 10-28 ton of fuel should be in the 12 inch plus size class. Old growth stands need at least 150 years to reach desired conditions. Natural disturbances cycles of fire, wind, insects and disease may prevent most stands from developing into desired old growth conditions.

Table 3-35: Desired Stand Conditions

Moist Mixed Conifer			Habitat Type groups 4-6	2-storied			
Structural Stage	Developmental Stage	Age in Years	Trees per Acre	BA	Average Diameter	Height	Canopy Closure
Stand Initiation	Seedling	1-10	300-2000 of which >250 WP/WL/PP/ with cedar present. For certification; minimum 300 TPA, 250 TPA long-lived serals, 80% stocked.	N/A	1-2inches	1-15 feet	N/A
	Overstory	100+	14 to 28	N/A	14 inches+	70-150 feet	15-25%

3.9.5.5 Vegetative Agents of Change

Vegetation is a fundamental part of terrestrial ecosystems. The vegetation that exists across an ecosystem and through time is a function of the climate, the geomorphology, the soil, the plant species available in an area, the disturbance history of the site, and the successional processes that follow disturbance. Most landscapes are a mosaic reflecting the interaction between disturbance and plant succession. Understanding how disturbances, succession and timber harvest interact with forest composition is necessary to understand the current vegetative state.

3.9.5.6 Weather

While fires can create dramatic changes to the Forest, weather continually modifies the ecosystem. Moisture and temperature are important to characterize the biophysical environment.

Weather is defined as how atmospheric conditions change over a short period of time. Weather disturbances adjust species composition, structure, and function consistently throughout successional development. Wind events, periods of high moisture, or drought determine growth rates, regeneration success and conditions conducive for insect, disease, or fire mortality. Weather is not predictable in terms of ecological timing or landscape arrangement, but has continual important influences on the ecosystem. The continual effects of moisture, temperature, and weather disturbances define the environment and therefore the compositions, structures, and function of the ecosystem.

3.9.5.7 Climate Change

Climate is defined as how the atmosphere behaves over long periods of time. Climate change and management of natural resources with a changing climate are both science and social issues. Managing in the face of climate change is a common forest management question, both in terms of the effect climate change will have on the managed ecosystem and the effect the Proposed Action may have on the climate.

The Forest Service has been involved in climate change research for two decades and has a century of science and management experience. The Forest Service has stated its objective regarding climate change as follows:

- The aim is to reestablish and retain ecological resilience of NFS lands and associated resources to achieve sustainable management and provide a broad range of ecosystem services. Healthy, resilient landscapes will have greater capacity to survive natural disturbances and large scale threats to sustainability, especially under changing and uncertain future environmental conditions, such as those driven by climate change and increasing human uses (Forest Service Manual 2020.2).
- The future of forest management in a changing climate is best addressed with approaches that embrace strategic flexibility, characterized by risk-taking, the capacity to reassess conditions frequently, and willingness to change course as conditions change (Hobbs et al. 2006 [cited in Millar et al. 2007]). The appropriate approach is an integrated strategy involving a scientific and social climate change approach that considers predictions/scenarios specific to the local ecosystem as well as analysis of specific ecosystem responses. The Washington Climate Change Impacts Assessment[2] is the most recent and area-specific tool available to understand potential changes in northern Idaho. Until more scientific details for this approach are available, a conservative forest management approach is reasonable. A conservative approach is based on diversity, resilience and adaptive management in the short, middle and long terms. This is the basis for proposed planting treatments in the Johnson Bar Fire Salvage Project.

3.9.5.8 Fire

While forests can be disturbed by weather, insects, and microorganisms, all of these interact with fire. Fire can release a large amount of energy in short periods of time, which is why fire is one of nature's most powerful disturbance forces. During summer, the Selway and Middle Fork watersheds experience significant dry periods when vegetation can sustain fires. Lightning was probably the primary ignition source prior to Euro-American settlement. Lightning and human causes are the present-day ignition sources. Fire suppression was

[2] http://cses.washington.edu/cig/pnwc/pnwc.shtml

considered to be effective at the landscape scale in the 1930s. Understanding fire as an agent of change allows understanding of the functional interactions in a healthy, sustainable ecosystem**.**

Understanding past fire disturbance or vegetation scenarios for an area allows increased understanding of the area's resilience and sustainability.

Currently, fires that start in under-burning conditions are usually extinguished at <1 acre in size. The mid-seral successional stages are, therefore, denser and more uniform over the landscape than those that would have occurred historically. Fire suppression activities were intended to be used in combination with timber harvesting to reduce high fuel volumes. Timber harvests designed to reduce high fuel volumes were reduced in the 1990s and high fuel volumes remain on the landscape. Timber is live fuel and when trees die they become heavy dead fuels also known as snags. When snags fall to the ground they become coarse woody debris which is also heavy fuel accumulations. For a more detailed discussion of fire ecology, refer to the fire/fuels specialist report.

3.9.5.9 Insects and Disease

In the absence of fire, forest insects and diseases can accelerate or reset forest succession by affecting tree species, size, and stand density. See figure 2 below. Functions of pathogens and insects in forests can be divided into two parts. First, the action, such as killing trees, decaying heartwood, or reducing growth. Secondly, the outcome, such as changing species composition of stands or changing stand structure from a mature, closed canopy to a pole-size, low-density structure (USDA Forest Service 2000). This level of susceptibility is important because over the last 75 years, insects and disease have replaced fire as the most prominent agent of change.

White Pine Blister Rust: White pine blister rust was introduced into northern Idaho and this analysis area in the early 1900s. Blister rust is a fungal disease that forms cankers on branches or stems of trees. The cankers then weaken the trees and may eventually kill them. Weakened trees also become susceptible to other disease or to insect attack. Trees were either killed or harvest was accelerated to capture anticipated loss of economic value. In addition, western white pine established following the 1910 fires was highly impacted by blister rust because the white pine had little natural resistance to the western white pine blister rust. The presence of live 50- to 80-year-old white pine is an indicator of some level of natural genetic resistance to blister rust in these survivors. Natural blister rust resistance is thought to be <10%. The live white pine is an ecologically important component of the resource area, both in terms of its resistance to blister rust and because of its role as a successional component as the stands develop.

Root diseases are a significant factor in stand composition and structure. Root diseases weaken the roots of late successional species facilitating wind throw. Wind throw is defined as trees blown down by wind events. Trees weakened by root rots are also susceptible to bark beetles. White pine and larch have a higher level of resistance to root diseases. Early seral species have reduced opportunities to re-establish due to the loss of mature seed bearing tree numbers. Early seral species numbers have been reduced due to fire exclusion without timber harvesting to allow early seral species to be re-established through planting. Western white pine blister rust killed a majority of the western white pine. Remaining white pine were harvested before mountain pine beetle and blister rust reduced timber values.

Major insect change agents in the Nez Perce/ Clearwater National Forest include mountain pine beetle, Douglas-fir beetle, Douglas-fir tussock moth, and fir engravers. Historically, mountain pine beetle played an important successional role in mature white pine and lodgepole pine forests. The presence of mountain pine beetle has led to significant changes in species composition and widespread tree mortality. Mountain pine beetle and Douglas-fir beetle mortality has resulted in fuel buildup and increased fire susceptibility. Historically, short-term increases in fuel loading may have led to increased fire intensity and severity which led to subsequent development of openings conducive to regeneration of early seral species. Root disease stresses trees making them more susceptible to bark beetles. The presence of root disease in many of the Douglas-fir and Grand Fir forest types has resulted in even higher endemic levels of the Douglas-fir beetle and the propensity for rapid beetle population buildups during favorable conditions.

3.9.5.10 Harvest

Logging activities were initiated in the area in the 1960s. Known past harvest in the project area has been cataloged and summarized in Table 3-55 Middle Fork drainage and Table 3-56 Selway Drainage. Regeneration harvest converted mature stands into early seral species in the stand initiation stage similar to stand replacing fires

3.9.5.11 Size Class

The size classes in the Johnson Bar Fire Salvage project are shown below in Table3-36. A majority of the trees are in the 15 to 19-inch size class, but due to growth rates may only be 80-100 years old.

Table 3-36: Pre-fire Size Classes

Size Class	Acres	Percent
Herb	125	0%
Shrub	393	1%
0-4.9	1,501	6%
5-9.9	3,377	13%
10-14.9	1,480	6%
15-19.9	15,649	58%
20+	3,518	13%
Unkown	745	3%

3.9.5.12 Old Growth Forest

Natural processes have removed old growth from 4 of the 6 OGAAs from meeting Forest Plan directives while keeping 2 OGAAs in compliance with Forest Plan directives. Forest health researchers from Coeur d'Alene found root rots can stall succession (Hagle, Tucker and Anderson, 2011). Natural successional processes and the agents of change have followed a natural trajectory with multiple interactions. Stands of trees can grow to become dense and overstocked. Root rots have weakened trees allowing the trees to become susceptible to Douglas-fir tussock moth, Douglas-fir bark beetles and mountain pine beetle. The tussock moth tends to attack trees with the most foliage whereas the Douglas-fir beetle and the mountain pine beetle tend to attack the larger, less vigorous trees [(Weatherby and Their) as cited in Kegley 2004] (USDA, 2004). Root rots, insects and trees blown over by the wind developed large volumes of fuel (Tappeiner *et al*., 2007 page 74). In some cases, insect infestations may have contributed to large stand-replacing fires (USDA Forest Service 1998a). Recently increased fuel has led to increased fire intensity (Jenkins, Runyon, Fettig, Page and Bentz, 2014). A series of natural events and interactions can lead to stand replacing fire as indicated in Table 3-37. Table 3-37 shows 950 acres of verified old growth and MA 20 were burned in the Johnson Bar fire.

The Forest Plan designates Management Area 20 (MA 20) to retain and to manage for old growth habitats. MA 20 for the Forest "…is made up of forested lands…and occurs on a variety of landtypes. Approximately half of the area has a timber condition class of overmature sawtimber (150 years or older). The remainder of the area is comprised of immature stands (40–80 years) that would provide for replacement old growth habitat" (USDA Forest Service 1987b, page III-56). In the Johnson Bar Fire Salvage project, a majority of the project area is in the 80-100 year old class.

The Forest Plan objectives for MA 20 are to maintain viable populations of wildlife species that are dependent on old growth habitat. At least 10% of suitable old growth habitat would be managed as old growth forest-wide. Data from the 2007 Forest Inventory and Analysis indicate that an estimated 13.4% of the Nez Perce Forest is old growth habitat, as defined by Green, Joy, Sirucek, Hann, Zack, and Naumann (2008). The lower and upper confidence interval bounds are 11% and 16.1%. The Forest meets the Forest wide old growth standard.

This acreage would be distributed across the Forest in a way that ensures that at least 5% of the forested acres within major prescription watersheds of 6,000–10,000 acres would be managed as old growth habitat (USDA Forest Service 1987b, page II-6). Appendix N of the Forest Plan describes the preferred distribution requirements and outlines an old growth identification process: "Old growth stands should be at least 300 acres. Next best would be a core block of 150 acres with the remaining blocks of no less than 50 acres and no more than ½ mile away from another old growth block. If existing old-growth blocks are less than 100 acres, the stands between the old-growth blocks should be managed as an old growth complex" (USDA Forest Service 1987b, page N-2).

Old growth analysis areas (OGAAs) were designated across the Forest in order to maintain the minimum Forest Plan requirements for amount and distribution of old-growth habitats.

The analysis area includes six OGAAs. Verified old growth is defined by Green et al. (2008) in Old Growth Forest Types of the Northern Region. Data derive from BARC maps, Verified Old Growth and MA 20 form GIS data base is shown in Table 8 in each OGAA. The Johnson Bar Fire Salvage project area had 1,017 acres of verified old growth before the fire. Management area 20 had 1,867 acres of 150 years old stands, that have not been verified for old growth, for a total of 2,884 acres (11%) of old growth in the project area before the Johnson Bar fire. The Johnson Bar fire burned 950 acres (4%) of old growth leaving 1934 acres (7%) of old growth in the project area. After reviewing the current inventory of old growth, only 2 of the OGAAs currently meet Forest Plan requirements, the other 4 OGAAs range between 0 and 4% old growth. As a result the silviculturist and wildlife biologist worked together to select recruitment old growth stands and meet forest standards. Recruitment old growth stands were select by aerial photo interpretation. When the most likely stands to meet old growth requirements were all selected, younger stands were chosen as recruitment old growth stands.

Table 3-37: Old Growth Conditions Pre- and Post-Fire

Pre-Fire Old Growth Condition						Old Growth Mortality from Fire		
Old Growth Analysis Units	Old Growth Analysis Units Acres	Verified Old Growth in Old Growth Analysis Unit (Acres)	MA 20 (Acres)	MA 20 + Verified OG (Acres)	Percent of Old Growth in Old Growth Analysis Unit	MA 20 + Verified OG Burned by Fire	Percent OG Burned by Fire	Percent OG Post Fire
OGAA03020104	9,963	0	0	0	0%	0	0%	0%
OGAA03020121	9,608	69	363	432	4%	7	0%	4%
OGAA03020122	9,251	484	897	1,381	15%	380	4%	11%
OGAA03020124	9,078	115	563	678	7%	470	5%	2%
OGAA03040007	10,089	296	834	1,130	11%	45	0%	11%
OGAA03040009	3,911	52	48	100	3%	48	1%	2%
Totals		1,016	2,705	3,721		950		

W. Case 3.2.15

Only two of the OGAA meet forest standards post-fire. Other analysis units are likely not meeting the old growth standards of the Forest plan due to interactions of natural disturbance cycles. Stand replacing fires, wind events, insects and diseases have cascading interactions that can lead to reductions of old trees and shade tolerant species with thin bark. More recruitment stands were selected in these old growth analysis units, but the time to reach old growth conditions may be longer than desired.

3.9.6 Direct and Indirect Effects

3.9.7 Alternative 1

3.9.7.1 Old Growth

Alternative 1 would not affect Management Area 20 (MA 20) or old-growth forest habitats, because no treatments would be conducted. Fire suppression would continue. Risk of large-scale stand-replacing fire would increase; the size or severity of such an event cannot be predicted.

MA 20 and old-growth habitats would continue to be altered by natural events such as succession, insect and disease, and wildfire. Some mixed-conifer habitats would mature and develop old-growth habitat characteristics, including multiple canopies, snags, and large downed wood, which provide habitat for a variety of wildlife species. Canopy openings created when snags fall would allow sunlight to reach the forest floor, providing for shrub, forb, and grass growth, which would become forage for ungulates and small mammals.

The risk of a crown fire would increase with increasing surface and ladder fuels. A wildfire would create large numbers of snags and would initiate young forest conditions. Canopy cover would be lost in varying amounts. A fire may reduce the amount of old-growth habitat available to species such as fisher, pileated woodpecker, goshawk, and American marten.

If no fires occur and no root rot is present, cumulative effects on MA 20 would be an increase in the amount of suitable old growth as stands age. A negative cumulative effect would occur in the event of another wildfire that removed old-growth habitat. It should be noted that in the 2014 Johnson Bar Fire 950 acres of verified old growth and MA 20 were burned. Predicting the size and severity of wildfires is not possible, so the level of potential cumulative effects cannot be determined.

3.9.7.2 Forest Composition/Cover Type

The No Action alternative favors Grand Fir and western red cedar regeneration. Grand fir is susceptible to root rot which inherently makes the stand susceptible to strong winds. Stands would likely have heavy fuels, and multiple age class structure.

3.9.7.3 Regeneration

Under the No Action Alternative, project area regeneration would be Douglas-fir, Grand Fir and western red cedar; however, western larch, ponderosa pine, and western white pine would not regenerate naturally in areas with less than 60% mortality. In areas with 100 % mortality, western larch, ponderosa pine, and western white pine would regenerate but would consist of less than 40% stand composition (Table 3-41). Lodgepole pine would regenerate in the few stands where lodgepole has been established in the past or is currently present. Without root rot the stands would naturally regenerate in 10-25 years.

Stands with root rots may not develop into mature stands. Root rots may suspend forest succession by killing young trees before they reach maturity (Hagle, Kegley, and

Wouldiams, year unknown). The regeneration of young stands where root rot is present may take 10 – 40 years to become established. Douglas-fir and Grand Fir would be susceptible to root rot and the stand would be in poor health.

The No Action alternative would allow a majority of the project area to be dominated by Grand Fir, western red cedar, and Douglas-fir. The Grand Fir and Douglas-fir would be susceptible to root rots which would weaken them and create opportunities for strong winds, fire, and disease (Trip Report CFO-TR-08-24, 2008). Western red cedar are also susceptible to heart rot and are often hollow from disease. Currently there are safety cautions when entering the project area due to rotten cedars falling down. The fallen cedar and grand fir would develop large fuel accumulations and place the project areas at risk to severe re-burn. Successional trends may be similar to the effects in the old growth analysis and as shown in Table 3-37.

Without fire and root rot, the No Action treatments high fuels would develop fertile soils (Graham *et al*., 1990). Western red cedar and Grand fir would develop into multi storied old growth.

For the No Action Alternative to produce early seral species wildfires would need to burn severe enough to leave a majority of the landscape with bare mineral soil. Bare mineral soils favor early seral species whereas, soils covered in timber litter and other ground covers favor late successional species regeneration , such as Grand Fir and western red cedar.

3.9.8 Alternatives 2, 3, and 4

3.9.8.1 Forest Composition

The primary vegetative difference between the action alternatives is the amount of acres planted with early seral species. Alternatives 2, 3, and 4 would convert 11%, 10%, and 9% of the project area to early seral species cover types as shown in Table 11. In the project area Alternative 2 would reduce western red cedar by 14%, grand fir by 7%, and Douglas-fir by 14%. The conversion of treated acres to early seral-mid seral species would make the Forest more resistant to wildfire, strong winds, insects and root rots. As a result of the treatments the Forest would be more resilient to the agents of change.

Early seral species need bare mineral soil to naturally regenerate. Soil disturbance and the removal of dead trees under the proposed action alternatives would create planting locations to plant seedlings. The planting success rate of individual trees after harvesting operations is over 90%. Accounting for our success rate more trees are planted to insure full stocking. Planting western larch, western white pine, and ponderosa pine would insure planting units would be regenerated in 5 years. lanting would shorten the time frame of forest establishment by 5-20 years. Planted trees grow more vigorously than natural regeneration because they are at least two years older and more capable of dominating the vegetation surrounding the planted tree. The larger stem size and root systems of the planted seedlings allows 2-4 more years of competitive advantage over natural seedlings (Hobbs, Tesch, Owston, Stewart, Tappeiner and Wells, 1992. P155). Planted seedlings higher competitive edge allows faster growth rates to successfully compete with brush and big game browse.

The removal of dead trees would reduce overstory shade which would improve growing conditions for early seral species. Limbs that fall during harvest operations and are retained in treated units would also create a mulch layer which would retain moisture and improve planting success (Graham, Minore, Harvey, Jurgensen, and Page-Dumroese, 1994); however excessive slash may inhibit tree growth. Jackpot burning activities are expected to reduce slash to acceptable levels.

Table 3-38: Cover Type Comparison Chart - Acres Converted to Early Seral Species

Johnson Bar Fire Salvage (Pre-treatment)	**Proposed Treatment Acres**				
Cover Type	**Current Conditions (No Treatment)**	**Current Conditions (Percent of Cover Type)**	**ALT 2**	**ALT 3**	**ALT 4**
Aspen	19	0%	5	5	5
Birch - Green Ash, Boxelder, Red alder	83	0%	1	1	1
Subalpine Fir - Spruce	39	0%	0	0	0
Western Red Cedar	8,353	31%	1,200	1,040	956
Grand Fir	7,370	28%	525	474	415
Douglas-fir	4,361	16%	598	535	500
Ponderosa Pine	38	0%	6	6	6
Lodgepole Pine	102	0%	22	22	22
Western White Pine / Western Larch	0	0	0	0	0
Western White Pine	0	0	0	0	0
Western Larch	0	0	0	0	0
Non Forest	35	0%	0	0	0
Unkown	9,388	35%	616	497	394
Totals	**26,788**		**2,973**	**2,580**	**2,298**
Percent of Acres Proposed to be Converted to Early Seral Species			**11%**	**10%**	**9%**
*Discrepancies in acres are due to GIS operations and rounding.					

3.9.8.2 Logging Effects

The salvage operation would have no direct effects on live vegetation, since the trees we are removing are already dead.

The project would have multiple direct effects on snags:

1) Snags would be removed from the project area reducing the invertebrate foraging areas of some bird species.
2) Snags and live leave trees used as nesting locations for small mammals, birds, and invertebrates would be reduced to 14-28 snags per acre in the treatment area.
3) The safety threat of the snags to people using the area would be greatly reduced.

The salvage logging effects are:

1) Long term reductions of large diameter fuels.
2) Accumulations of slash that would provide ground cover and develop the soil (Graham, Harvey, Page-Dumroese, Minore and Jurgensen, 1990).
3) Soil disturbance that functions as site preparations for natural regeneration (Tappeiner *et al*., 2007) (Hobbs, Tesch, Owston, Stewart, Tappeniner and Wells, 1992).
4) Create open stands that are susceptible to strong winds (Agee, 1993) (Tappeiner *et al*., 2007)

Harvesting operations would leave 14-28 live trees and/or snags for wildlife and coarse woody debris. The remainder of the dead trees would be removed.

As a fuels treatment, salvage logging would restore the forest to surface fuel levels consistent with mixed severity fire regime (Petersen, Dodson and Harrod, 2015). Salvage logging removes heavy fuels reducing the risk of “re-burn” with high fire intensities which can vaporize soil nutrients (Grier, 1975).

Harvesting operations would expose mineral soil which is needed for seedlings to establish the next stand (Tappeiner *et al*., 2007). Slash would provide shade for regeneration, act like mulch, and reduce possible erosion. Woody debris would facilitate soil development in the future (Graham et al. 1990). Trees surviving the fire would provide seed to regenerate the next stand. Regeneration would take 5 years after planting to become established.

Thinned stands are at risk to being blown down by strong winds also referred to as windthrow. Salvaging or thinning trees would increase wind speed in the stand (Agee, 1993). Increased wind speed may blow down trees that are newly exposed to the wind. Trees resistant to wind have good root systems, and proper height to diameter ratios. Trees released from competition with greater than 40-50% crown can grow in diameter and increase wind resistance. Large canopies may catch the wind and facilitate windthrow. Most stands become windfirm about 5 years after treatment, however even stable stands can be blown down during extreme wind storms.

3.9.8.3 Regeneration

The multiple effects of harvesting operations on regeneration are listed below;

1) Soil disturbance needed for natural regeneration (Tappiener *et al*., 2007).

2) Limbs would form a mulch retaining moisture for regeneration planting success (Graham, Minore, Harvey, Jurgensen, and Page-Dumroese, 1994).
3) Removing the snags during the harvesting process reduces shade and microsites.
4) Excessive slash may prohibit planting.

It should be noted that there is a difference between soil disturbance and soil degradation (Tappiener, *et al*., 2007). Early seral species need bare mineral soil to naturally regenerate. Soil disturbance would create planting locations to plant seedlings. The planting success rate of individual trees after harvesting operations is over 90%. Accounting for our success rate more trees are planted to insure full stocking. Planting western larch, western white pine, and ponderosa pine would insure planting units would be regenerated in 5 years.

The seedlings would have little impact on transpiration rates the first two decades because they are small and only 300-360 trees per acre would be planted. However, planting would shorten the time frame of forest establishment by 5-20 years. Planted trees grow more vigorously than natural regeneration because they are at least two years older and more capable of dominating the vegetation surrounding the planted tree. The larger stem size and root systems of the planted seedlings allows 2-4 more years of competitive advantage over natural seedlings (Hobbs, Tesch, Owston, Stewart, Tappeiner and Wells, 1992.). Planted seedlings higher competitive edge allows faster growth rates to successfully compete with brush and big game browse.

3.9.8.4 Insect and Disease

Only dead trees would be salvaged. Dead trees with bark beetles in them may be harvested but the current treatments are insignificant to effect bug populations.

Planting preferred species would make a healthy forest in the future. Western larch, ponderosa pine and western white pine are resistant to root rots (Trip Report CFO-TR-08-24, 2008). These trees would grow faster without the infection of root rots. The preferred planted species would be more resistant to fire, strong winds, insects, and disease.

3.9.8.5 Whitebark Pine

Burned areas are not in whitebark pine habitat and provide no opportunities for whitebark pine regeneration. In effect the project would not harm individual whitebark pine and would not push the population towards federal listing as an endangered species.

3.9.8.6 Old Growth

Stands that are resistant to strong winds, fire, insects and disease are more likely to live into the old growth stage and fill the ecological niche needed by old growth dependent species. Silvicultural treatments are designed to promote individual tree, stand, watershed and Forest health. The resiliency of early seral species allows for healthier forest that can live longer and meet old growth objectives.

None of the action alternatives would harvest old growth. Only dead trees are proposed for harvesting. The burned treatment areas no longer meet old growth requirements and most were not old growth prior to the fire. No live trees would be harvested so there would be no effects to the size, diameter or age of the stand. Most stands in the Johnson Bar area are not old enough to meet old growth requirements. The young forest conditions are likely due to insects, disease and the fire regime. Fires in 1889, 1910, 1920, 1928, 1945, and 2014 have burned large portions of the project area.

Upon review of the area it was found that the Nez Perce-Clearwater National Forest was not meeting the old growth requirements as directed in the Forest Plan. An assessment was made that determined;

1) How many acres of verified old growth remained after the fire?
2) How many acres are being managed for old growth?
3) How many acres managed for old growth was burned in the fire?

These findings are shown in Table 3-39. The assessment found that the project area was not meeting Forest Plan direction. The current condition is likely due to the burn severity which changed stand characteristics such that the stands no longer function as old growth. Further field reviews are planned as the project progresses to verify no old growth stands would be cut.

Upon further review the silviculturist and the wildlife biologist selected old growth recruitment stands through photo interpretation that appeared to be nearing old growth conditions. The selected stands did not meet the 10% requirement of the Forest Plan so more so more recruitment stands were selected. The second round of recruitment old growth stands were much younger and would take several decades to grow into old growth conditions. The process described above has all 6 OGAAs in compliance with the Forest Plan direction.

Table 3-39: Old Growth Recruitment Comparison of Changes to Verified Old Growth and MA 20

Planned Old Growth Recruitment			Alternative Comparisons			
9	10	11				
	(4+9)-6	10/1				
Recruit OG	All MA 20, Verified OG and Recruit OG	All MA 20, Verified OG, and Recruit OG Percent	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 4
978	978	10%	0%	0%	0%	0%
641	1,066	11%	4%	4%	4%	4%
0	1,001	11%	11%	11%	11%	11%
769	977	11%	2%	2%	2%	2%
0	1,085	11%	11%	11%	11%	11%
360	412	11%	2%	2%	2%	2%
2,748	5,519					

3.9.9 Comparison between No Action Alternative and the Action Alternatives

Acres in a particular age class, habitat type, structure or size class would not change because treatments would only harvest dead trees. Verified old growth acres would not change.

Table 3-40: Alternative Comparisons of the Vegetation Response Units

VRU Number	VRU Acres in Project Area	VRU Acres in Alternative 2	VRU Acres in Alternative 3	VRU Acres in Alternative 4
VRU 3	327	0	0	0
VRU 7	5	0	0	0
VRU 8	19,839	2,445	2,077	1,772
VRU 10	2,999	32	32	32
VRU 17	3,861	497	471	494
Totals	27,031	2,974	2,580	2,298

In the Johnson Bar Project most of the treated acres are in the vegetative response unit 8 (VRU 8) and is described as follows. Grand Fir, Douglas-fir and western red cedar dominate the site in the late successional stage of VRU 8. Vegetative response unit 8 in an early successional stage is a mixed stand of lodgepole pine, western larch, and western white pine. Ponderosa pine may be present along with Engelmann spruce and Pacific yew.

The effects of the No Action alternative are described below. With no treatment alternative, in a mixed severity fire of 60% mortality, VRU 8 would allow natural Grand Fir and western red cedar to dominate the site. A stand replacing fire would increase early seral species populations on the site. Grand Fir and western red cedar would still dominate the site in an early successional stage (Table 3-41).

The effects of Alternatives 2, 3, and 4 are described below. Alternatives 2, 3, and 4 are salvage and planting treatments that vary by the acres as shown in Table 3-41. Salvaging would reduce heavy fuels and prepare the site for planting. Planting would increase early seral species on the site as shown in the last line of Table 3-41. In a mixed severity fire of 60% mortality, seral species composition would increase in the stand as shown in Table 3-41. In a stand replacing fire planting early seral species would substantially increase the percentage of long lived early seral species. Vegetation response units, 10 and 17 would have a similar response as VRU 8 and increase in early seral species composition. Without planting early seral species would naturally succeed out of the stand composition.

Table 3-41: Treatment versus No Treatment Comparison of Early Seral Species

2102 Stocking				
	60% Mortality in 2014		100% Mortality in 2014	
Species	**Planted**	**No Treatment**	**Planted**	**No Treatment**
WP	12%	0%	18%	0%
WL	7%	Trace	24%	1%
DF	19%	18%	0%	64%
GF	17%	25%	5%	0%
WRC	19%	54%	32%	0%
PP	26%	1%	21%	25%
LP	0%	Trace	0	10%
ES	0%	1%	0	0%
SAF	0%	1%	0%	0%
Percent of Species Resistant to Root Rot	45%	1%	63%	36%

Forest health researchers from Coeur d'Alene found root rots can stall succession (Hagle, Tucker and Anderson, 2011). Natural successional processes and the agents of change have followed a natural trajectory with multiple interactions. Stands have grown to become dense and overstocked. Root rots have weakened trees allowing the trees to become susceptible to Douglas-fir tussock moth, Douglas-fir bark beetles and mountain pine beetle. The tussock moth tends to attack trees with the most foliage whereas the Douglas-fir beetle and the mountain pine beetle tend to attack the larger, less vigorous trees [(Weatehrby and Their) as cited in Kegley 2004] (USDA, 2004). Root rot, insects, and wind thrown trees have developed large volumes of fuel (Tappeiner *et al.*, 2007) and have created fire conditions that are resistant to containment and control. In some cases, insect infestations may have contributed to large stand-replacing fires (USDA Forest Service 1998a). Recently increased fuel has led to increased fire intensity (Jenkins, Runyon, Fettig, Page and Bentz, 2014). High levels of surface fuels resulting from dead trees lead to the intense fire behavior that may damage the soil.

The proposed activities would increase early seral species within the project area. These species are resistant to strong winds, fire, insects and disease are more likely to live into the old growth stage and fill the ecological niche needed by old growth dependent species. The resiliency of early seral species allows for healthier forest that can live longer and help to meet old growth objectives.

Treatment areas previously dominated by Douglas-fir, Grand Fir and western red cedar before the fire would become a more species diverse stand with early seral species like western white pine, western larch and ponderosa pine. The early seral species are resistant to fire and root rots which would increase forest health on the treated acres.

3.10 Visuals

3.10.1 Analysis Area

The landscape encompassing the Johnson Bar Fire Salvage project area is located to the east of U.S. Highway 12 and south of the Selway River road at the confluence of the Selway and Lochsa Rivers. It is within the Nez Perce – Clearwater National Forests, approximately 20 miles east of Kooskia, Idaho. The Fenn Ranger Station is located in the northeast corner of the project area. Within the area of interest is the Middle Fork of the Clearwater River, the Selway River, Swiftwater Creek, Elk City Creek, Goddard Creek, O'Hara Creek and many smaller water courses. Of greatest concern for scenic quality are the views from the major road and trail access corridors, campgrounds and concentrated use areas found in and adjacent to the area of interest. The Johnson Bar project proposes management activities to improve vegetation resources and forest resiliency at the landscape level; utilize dead, dying and high risk trees in a timely manner; manage forest vegetation to restore natural disturbance patterns; improve watershed conditions; improve elk habitat effectiveness; improve early seral wildlife habitat and maintain habitat structure, function, and diversity.

3.10.2 Regulatory Framework

General direction for scenery management is provided in Forest Service Manual 2380 (Landscape Management). Specific visual resource management direction is provided by the 1987 Nez Perce National Forest Plan and is described in terms of visual quality objectives (VQO). Forest plan VQO standards and guidelines were based on the Visual Management System described in Agriculture Handbook Number 462, National Forest Landscape Management, Volume 2 (PF-Doc. PI-R02). The visual management system was revised in 1995, and is now known as the Scenery Management System. The revised guidelines are provided in Agricultural Handbook 701, Landscape Aesthetics: A Handbook for Scenery Management (USDA Forest Service 1995; PF Doc. VIS-R01). While the terminology of the

VQO system would be used to describe the project, the techniques and methodologies described in the Scenery Management System would also be used to analyze the project.

3.10.3 Analysis Methodology

Although the Visual Management System (PF Doc. VIS-R02) has been replaced by the Scenery Management System (PF Doc. VIS-R01), this analysis uses terminology used in the forest plan which was developed and written under the former. A crosswalk between the two systems is found in Agricultural Handbook 701, Appendix A (PF Doc. VIS-R01). Visual quality objectives (VQOs) are based on the area seen from sensitive viewpoints such as travel corridors, urban areas where the forest background scenery is important and other features where there may be a high visual sensitivity level. These visually sensitive viewpoints are outlined in the 1987 Nez Perce National Forest Plan. A variety of tools were used in the visual resource analysis including analyzing VQO maps, field visits and visibility modeling.

Using ArcMap 10.2 (ESRI Inc., 1999-2009), GIS shapefiles of harvest units were overlaid on spatially rectified VQO displaying scenic variety class, distance zones and sensitivity levels, and quality objectives across the area of interest. Original VOQ maps were prepared for the 1987 forest plan using the process outlined in the Agriculture Handbook Number 462 (1976; PF Doc. VIS-R02).

Treatment units and their associated VQOs were evaluated in relation to visually sensitive viewpoints identified in the forest plan to determine the extent to which proposed activities would likely be seen, and the likelihood that those activities would adversely affect VQOs. VQO maps prepared under the forest plan are very general in nature. Scenic class and sensitivity level can provide a general understanding; however, the maps can’t always illustrate how visible specific treatments would be from locations of concern, or the extent to which treatments are likely to stand out or blend with existing scenic features.

Initial field reconnaissance was done to further assess the visibility of potential treatments in the context of the current landscape. Points on VQO maps with direct line of site to treatment units were identified. Units were observed from these locations, using unit maps. Proposed harvest activities are found in all viewing zones when viewed from key viewpoints. To assist in determining unit visibility, the analysis used Google Earth (Google Inc. 2015). Treatment units for each alternative were imported into Google Earth and draped over the landscape. Units were then viewed from ground level or “street view” at a variety of representative sensitive locations, including: U.S. Highway 12 and its associated recreation sites, the Selway Road and its associated recreation sites, Fenn Ranger Station, Forest Road 470 and Lookout Butte Lookout. This 3-D modeling gives a different perspective on how visible a given area is from a specific geographic location. A limitation of using Google Earth for determining visibility is that near view screening from adjacent trees cannot be taken into consideration. For instance, if you are on a trail or road, the 3-D imaging cannot place you down amongst the trees, where your view might be obscured by trees and other vegetation in the foreground. These areas were then field verified and digital photography was compared to the Google images to determine the final effect on the visual resource.

After establishing relative sensitivity of affected areas when viewed from key viewpoints, Agricultural Handbooks 462 and 701 were used as references to determine if proposed activities were likely to modify the landscape to the extent that visual quality objectives could not be met.

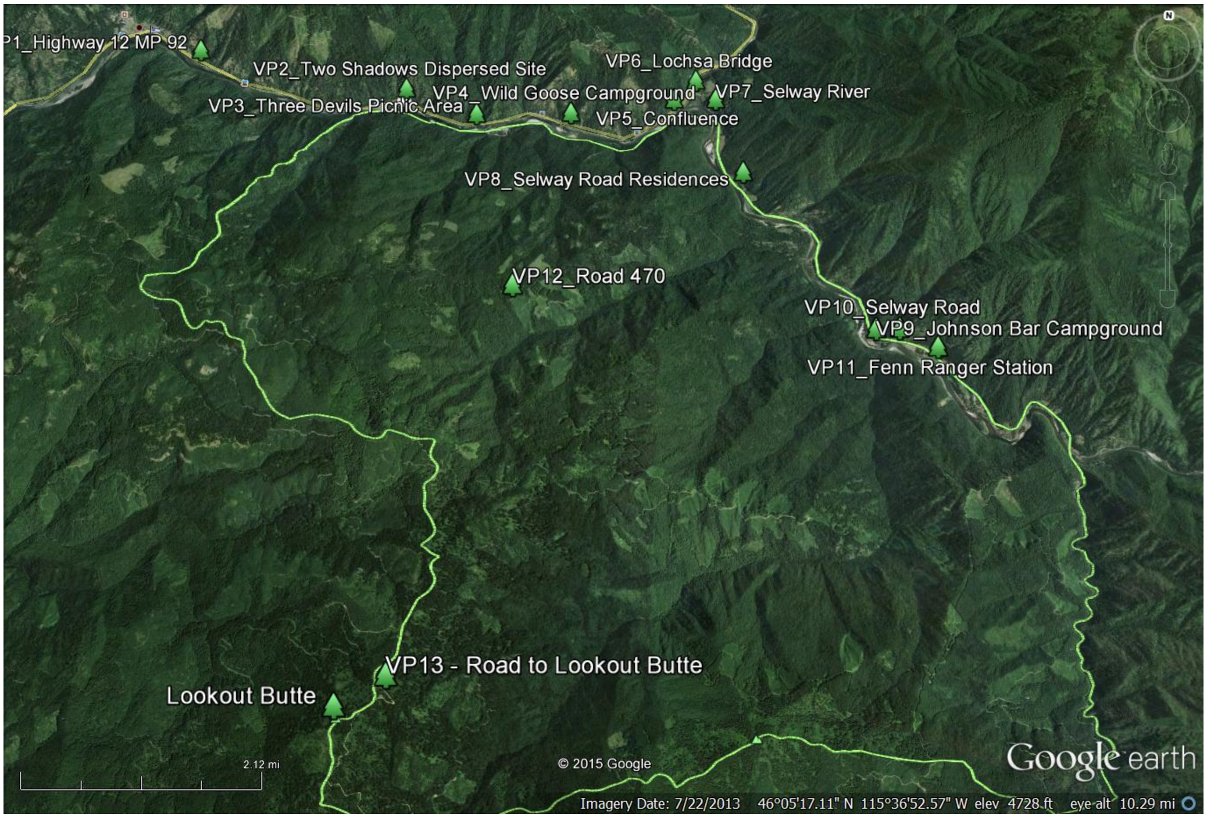


Figure 5: Critical viewpoints included for the Johnson Bar Fire Salvage Project

3.10.4 Resource Indicators

Visual Quality Objectives (VQOs) provide measurable standards for scenery management in conjunction with demands for goods and services from the forest. Visual resource management is integral to all management areas and implied in all management goals. The forest plan standard relevant to the project area for the Johnson Bar Fire Salvage project area visual resources are:

1. Meet adopted visual quality objectives (VQOs). Exceptions occur in unusual situations: these are identified through the project planning process involving an interdisciplinary team. Mitigation measures should be developed for areas when VQOs are not met.
2. The visual resource has been evaluated based on visual sensitivity levels assigned to travel routes, use areas and water bodies in and adjacent to the Nez Perce - Clearwater National Forests. Adjustments in the VQO boundaries based on project level analysis would conform to principles in FSM 2380.

The analysis considers the character and appearance of the surrounding natural landscape and the VQOs of areas proposed for treatments as assigned under the current forest plan. VQOs are a desired level of scenic quality and diversity of natural features based on physiological and sociological characteristics of an area, and refers to the degree of acceptable alterations of the landscape. Management activities such as commercial timber harvest and road construction can alter the scenic character of the landscape. There is a potential concern that activities proposed in alternatives 2, 3 and 4 could adversely affect visual resources to the extent that the VQOs established by the current forest plan (1987) would not be met.

Effects to the visual resource are discussed in general terms; however, the indicator used to measure effects is whether or not VQOs are achieved. Visual quality objectives for the Johnson Bar Fire Salvage Project are listed in Table 1. Below is a brief description of each objective level.

- ***Preservation***: In general, human activities are not detectable to the visitor.
- ***Retention***: Human activities are not evident to the casual Forest visitor.
- ***Partial Retention***: Human activities may be evident, but must remain subordinate to the character of the landscape.
- ***Modification***: Human activities may dominate the characteristic of the landscape but must, at the same time, utilize naturally established form, line, color, and texture.
- ***Maximum Modification***: Human activity may dominate the characteristic landscape, but should appear as natural occurrences when viewed as background.

3.10.5 Affected Environment

Planned activities would be visible in foreground, middleground and background views from the Fenn Ranger Station and Visitor Center; Fenn Pond; O'Hara Creek, Johnson Bar, and Wild Goose Campgrounds; Three Devils Picnic Area; the interpretive site at the confluence of the major rivers; and several residential and administrative areas. Critical road access corridors include: U. S. Highway 12, Selway River Road #223, Swiftwater Road #470, Hamby Fork Road #651, and West Lodge Road #653. Popular trail corridors include Hot Point Trail #706, Peterson Point #712, Peterson Burn #715, and Swiftwater Crosscut #716.

Visual impacts as a result of the proposed activities were analyzed to determine if the activities would meet Forest Plan standards for scenic quality. Visual simulation techniques are used to analyze these visual impacts. Numerous viewpoints were reviewed to determine the short- and long-term impacts to scenery within the resource area.

3.10.6 Existing Condition

The Johnson Bar area of interest is located approximately 20 miles east of the community of Kooskia, Idaho. The analysis area is part of the Bitterroot Mountain range and is large rivers, moderately steep canyon walls to rolling uplands. The Middle Fork of the Clearwater canyon has a river course with larger rock features and fairly rapid flowing river. It has steeper canyon walls with a mix of coniferous and deciduous vegetation. The Selway River canyon is broader, with a relatively shallow, slower flowing river. Both the Middle Fork of the Clearwater and the Selway River are designated wild and scenic rivers.

The canyon walls are less steep with more of the rolling uplands visible to the viewer traveling the river corridor. The vegetation in the Selway River corridor is mixed coniferous species with deciduous vegetation along the river's edge, especially surrounding the private residences that are located along the river. Many of the river corridors and much of the lower elevation areas have significant populations of western redcedar. Other mixed conifers, composed mostly of grand fir and Douglas fir, are found across the rolling hills adjacent to the streams. There are beach areas and some distinctive rock outcrops along the river corridor. While most of the hillsides have a continuous canopy of coniferous vegetation there are areas of open grass and patches of deciduous shrubbery along the steeper hillsides.

During the late summer and early fall of 2014 this area experienced a wide ranging fire event that burned nearly 12,000 acres across the rolling uplands, down most of the major ridgelines of the area of interested and created some fire corridors that reached as far down the ridges as the actual river. The intensity of the fire ranged from minimally damaged areas that did not kill the larger trees to areas where no live trees were left in significantly sized areas. This would create a mosaic of openings where there would be just a thinning of the trees to areas where there would be large openings visible.

Recreation users visiting the Lochsa and Selway River areas participate in wide variety of recreation pursuit ranging from dispersed recreation activities such as berry-picking, dispersed camping, driving for pleasure, historical exploration and enjoying the various winter and summer trails in the area to highly organized developed camping, outfitted river experiences and educational group tours. These popular destinations bring thousands of visitors every year. The river canyons form the backdrop of the visitor's recreational setting and scenic quality is of major concern to many of the visitors and residents of the area. Both U.S Highway 12, which makes up the northern border of the area of interest, and the Selway Road #223, found along the north east boundary of the area, are considered travel corridors with a high concern for scenic quality. The Swiftwater Road #470 is used moderately for recreation purposes and has a moderate concern for scenic quality. Trails 706, 712, 715, and 716 are lightly used and may not still be evident in some areas. Concern for scenery from these corridors would not be considered to be critical.

There is evidence of past harvest activities within the area of interest. Most of these past harvest activities are still visible but have vegetated to the point that they often don't appear as distinctive openings. While some openings are still evident, they do not tend to dominate the existing landscape character. These openings are in various stages of regeneration but most would take at least 10 to 15 years to appear as only natural timber stands without man-made openings.

Some of the recent fire activity occurred within past harvest units, but the majority of the fire occurred in the heavily forested areas adjacent to past harvest activities or in areas that had no past activity. In the northern portion of the area there are a number of small openings found above the Middle Fork of the Clearwater River which can been seen, but meet the VQO of *Partial Retention* in the middleground viewing zone from Highway 12, the river corridor and recreation sites along the river. Larger openings can be found along the Swiftwater Road, but are located in the rolling uplands and are not generally visible from either of the river corridors. These openings are evident from the Swiftwater Road itself. While they are evident they do meet the criteria for *Partial Retention* and *Modification* for that road corridor. Additional large openings area found along the ridgeline above Goddard

Creek in the southern portion of the area of interest, these openings were created in the 1980s and 1990s and are still evident although they are beginning to appear more natural. This area meets the VQO of *Modification*.

3.10.7 Desired Future Condition

The desired condition for scenic quality within the area of interest would be to retain the existing landscape character and maintain the designated visual quality objectives of *Retention, Partial Retention, Modification* and *Maximum Modification* from travel corridors and use areas. The foreground viewing zone of U.S. Highway 12 and the Selway road is *Retention*. These roads roughly make up the northern and northeastern borders of area. Views from the river corridors, road corridors and campgrounds within these important travel ways should maintain a visual condition where openings do not appear man-made. The Swiftwater Road #470 roughly bisects the area of interest and has a sensitivity level of 2. This corridor has the VQO of *Partial Retention* in the foreground and *Modification* in the middle and background views. Harvest activities within the viewing zone of this road can be evident but should not dominate the landscape character of the area.

Table 3-42 outlines the visual quality objectives listed in the 1987 Nez Perce National Forest Plan.

Table 3-42: Listing of key viewpoints, their sensitivity level and visual quality objectives found within the Johnson Bar Fire Salvage Project area. Viewpoints or viewing corridors come from the 1987 Nez Perce National Forest Plan

View Point or Viewing Corridor	Sensitivity Level	Foreground 0 – ¼ mi.	Middleground ¼ mi. – 3 mi.	Background 3 mi. – 5+ mi.
U.S. Highway 12	1	Retention	Part. Retention	Modification
- Three Devils Picnic Area	1	Retention	Part. Retention	Modification
- Wild Goose Campground	1	Retention	Part. Retention	Modification
Selway Road #223	1	Retention	Part. Retention	Modification
- Johnson Bar Campground	1	Retention	Part. Retention	Modification
- O'Hara Campground	1	Retention	Part. Retention	Modification
- Cedar Flat	1		Part. Retention	Modification
- CCC Trailhead	1	Retention	Part. Retention	Modification
Fenn Ranger Station and VC	1	Retention	Part. Retention	Modification
Lookout Butte Lookout	2	Partial Retention	Modification	Maximum Mod.
Road 470 (Swiftwater Road)	2	Partial Retention	Modification	Modification
Trails 706, 712, 715, 716*	3	Modification	Modification	Maximum Mod.

**A sensitivity level of 3 with a corresponding VQO of Modification in the foreground viewing zone, Modification in the middleground and Maximum Modification in the background viewing zone from these corridors is appropriate for these trails.*

All alternatives propose harvest activities within the *Retention* VQO adjacent to the Middle Fork of the Clearwater and Selway Wild and Scenic River corridors. There are a number of proposed harvest units along the Swiftwater Road that would be within the Partial Retention VQO, but the majority of units being proposed for activity are within the *Modification* VQO which forms the middleground and background viewing areas from all the sensitivity viewing areas.

3.10.8 Direct and Indirect Effects

Table 3-431: Summary of how the alternatives address key issues

Issue Indicator/Measure	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3	Alternative 4
Meet Forest Plan VQOs	Would meet VQO, but the scenic character of the area would continue to be affected by increases in dead and dying vegetation due to fire activity in the area. The area would also continue to be susceptible to further catastrophic wildfire.	Although activities would be visible from critical viewsheds, the harvest proposal would meet the VQO of retention in the foreground and partial retention along the Swiftwater Road with the use of design measure utilized to emulate the effects of natural processes. Areas outside critical viewshed would meet the VQO of modification. Long term goals of a more healthy and resilient forest would also improve the scenic character over time.	Proposed harvest in alternative 3 would be reduced slightly from alternative 2 with the elimination of unit 116 within the Selway River road foreground viewing zone. This alternative has the lowest percentage of skyline harvest methods and the highest percentage of helicopter harvest. Harvest activities would be visible from most viewpoints, but proposed units would have the design measures to insure that openings have the appearance of openings created by natural processes.	Proposed harvest in alternative 4 would be reduced, especially in the U.S. Highway 12 viewing zone. Harvest units within the retention VQO of the Selway Road would also be reduced. This alternative has the highest percentage of skyline harvest methods. Harvest activities would be visible from most viewpoints, but proposed units would have the design measures to insure that openings have the appearance of openings created by natural processes.

3.10.8.1.1 Alternative 1

With no harvest activity planned to occur under alternative 1 (No Action) there would be no direct or short-term effects to the scenic condition of the area. The openings in forest cover that are visible as a result of past forest management would continue to recover tree growth, and over time would fill in unnatural appearing openings. The existing man-made openings would remain visible for another 10 to 15 years. Processes affecting forest dynamics would continue, including continuing changes related mortality from the wildfire event. Dead and dying trees, which would appear as individual and groups of dead trees scattered across the landscape would be found throughout the area. This may increase further risk of wildfire as the amount of dead and dying vegetation increases. While for some, this may have a negative impact on the scenic quality of the area, these activities are considered natural processes, and the resource area would continue to meet assigned VQOs.

3.10.8.1.2 Alternatives 2, 3, and 4

Transportation System – New temporary road construction is proposed in all alternatives ranging from 0.2 mile in alternative 3 to 3.7 miles in alternative 4. The development of temporary roads using existing road template ranges from 0.5 mile to 0.6 mile. These roads would be visible from roads and trails within the area of interest, but would be naturalized after the project is complete and would therefore have no long term effect on the scenic quality of the area. Short tractor swing trails would be required in a few areas. The limited extent of this activity would have limited visual effects within the overall area of interest.

Reconstruction, reconditioning, and system road maintenance of existing roads would have minor evidence of disturbance in the short term, but would have no visual impacts in the long term.

Road decommissioning would occur for both system (1.1 miles) and non-system roads (20.2 miles). While there may be short term visual affects related to decommissioning, the long term effects of this active would be positive for the scenic resources of the area. Putting roads in long term storage would have no significant effects on the scenery of the area.

Site Preparation and Reforestation – All of the proposed harvest areas would be prepared for reforestation and then replanted with appropriate coniferous species. These activities would have a positive long term effect on the area because it accelerates the process of revegetation.

3.10.8.1.3 Alternative 2

This analysis is mainly concerned with the landscape that can be observed from viewpoints identified in the forest plan. (See Table 3-42 and Figure 5.) Proposed activities that are blocked from these viewpoints by terrain are considered to be in compliance with VQOs. Proposed management actions that have concern from a scenic resource standpoint are evaluated for how they conform to naturally occurring features that exist or could be created by natural events. Many of the proposed management features have short term visual effects, but would not have long-term scenic effects. Road maintenance is an example of a management action that rarely has a long-term effect on scenic resources and is covered in actions common to all action alternatives.

The Johnson Bar Fire Salvage area of interest is located within the foreground, middleground and background viewsheds of U.S. Highway 12 and the Selway River road the their associated recreation facilities, the Fenn Ranger Station, the Swiftwater Road and other related viewing areas.

U.S. Highway 12 – Following the Middle Fork of the Clearwater River from Syringa to Lowell, Idaho, there are numerous views of the units located on the north-facing portion of the slope. These units include 143, 144, and 101 across the canyon from Three Devils Picnic Area; units 101 and 102 viewed from Wild Goose Campground and unit 103 viewed from the confluence interpretive site. All these units lie across major ridgelines that are roughly perpendicular to the river corridor. The lower portions of these ridgetop units fall within the *Retention* VQO and the upper portions are generally within the *Partial Retention* VQO. Harvesting would occur, but more stand structure would be retained in the lower portions of the units that fall within the *Retention* VQO. Two helicopter landing sites are proposed within the U.S. Highway 12 corridor. These sites have been used previously and restored. These would be restored to their original condition when the project is complete.

Harvesting would occur along ridgelines affected by fire in the area, but would use natural breaks and retention of groups of trees to more closely emulate the natural openings found within the drainage. Existing roads would be used so no new roads would be evident. Changes would be visible, but would mimic natural openings and be designed to reduce the visual impact of the harvest methods so the openings would not dominate the existing landscape character of the area of interest. With design features in place, these units would meet the VQO of Retention and Partial Retention in the foreground and middleground viewing zones from U.S. Highway 12.

<u>Selway River Road</u> – Along the Selway River the canyon is more open and the canyon walls less steep creating a more open landscape character. Larger portions of the canyon can be viewed for longer periods of time from the roadway and the river. There are numerous residential lots along this corridor in addition to the recreation sites found here. Foreground views of units 103,104, 126 and 145 would be of greatest concern. These are also areas where the fire was more active, coming down as far as the river in several places. There would be openings created from the fire both within the harvest units and from the fire activity itself.

Harvest units 103, 104, 126, and portions of 116 are within the *Retention* VQO. Again enough stand structure would be retained so that the management activities are not evident to the forest visitor. Area further up the slope, within the *Partial Retention* or *Modification* VQO can have evident man-made openings but must remain subordinate to the inherent scenic character.

<u>Swiftwater Road</u> – Harvest units are located along the entire length of the Swiftwater Road #470 and within the viewshed looking east across the Swiftwater Creek drainage. The Swiftwater Road is a significant travel corridor for recreation use and has a foreground VQO of *Partial Retention* and a middleground VQO of *Modification*. The road passes through units 103, 104,105, 106, 107, 108, 109, 110, 110, 136, 138, and 139. There are also views from the road of units 113, 114, 115, 116, 140 and 142. Within the foreground zone, harvest activities can be visible, but should not dominate the existing landscape character. Retention of live trees along the roadway as screening vegetation and use of design measures for development of unit boundaries would be critical to maintain the VQO of *Partial Retention* in the foreground. Units viewed from the roadway across Swiftwater Creek would be designed to appear as natural openings through retention of live trees where possible. Areas of intense fire activity would have larger openings along the ridgetops so harvest activities may begin to dominate the existing landscape character. This would still meet the VQO of *Modification* in the middleground.

<u>Elk City and Goddard Creek Drainages</u> – These two large drainages have large areas of intense fire activity, especially along the ridgetops. There are no major roads or trails that

are recreation destinations and therefore have a VQO of *Modification* throughout. Units within these drainages would have unit boundaries that appear as natural openings, but they would be larger and would have fewer tree retained. Units within this area include 117, 118, 119, 120, 121, 122, 123, 124, 125, 127, 128, 129, 130, 131, 132, 133, 134, 135, and 145.

Table 3-44: Effects of harvest units and proposed treatments on Scenic Quality in Alternative 2

Units	Proposed Treatment	Range of Canopy Cover (percent)	Seen from Critical Viewpoint?	Forest Plan Visual Quality Objective
U.S. Highway 12 – 101, 102, 103, 143, 144	Fire Salvage	Varies depending existing dead and dying vegetation	Yes; U.S. Highway 12, Three Devils Picnic Area, Wild Goose Campground, and the confluence interpretive site.	Retention in the foreground, partial retention in the middleground and modification in the background
Selway River Road – 103,104, 116, 126, 145	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	Yes; the Selway River road, Johnson Bar Campground, Fenn Ranger Station and VC, CCC Trailhead and O'Hara Campground.	Retention in the foreground, partial retention in the middleground and modification in the background
Swiftwater Road and Lookout Butte - 104, 105, 106, 107, 109, 109, 110, 111, 112, 113, 114, 115, 116, 136, 137, 138, 139, 140142	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation. Areas affected are larger and more prevalent in this drainage.	Yes; from Road 470 and the Lookout Butte access road.	Partial Retention in the foreground and Modification in the middle and background
Misc. roads and trails within the Elk City and Goddard Creek drainages – 117, 118, 119, 120, 121, 122, 123, 124, 125, 127, 128, 129, 130, 131, 132, 133, 134, 135	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	No; activities viewed from minor roads and trails	Modification

3.10.8.1.4 Alternative 3

This alternative is very similar to Alternative 2. Harvest activities have been reduced with the elimination of unit 116 and reduction of unit 4, located adjacent to the Selway Road. This unit was within the *Retention* VQO. There was still fire activity within the area of the unit so it still may appear as an opening as the fire damaged trees die and fall to the ground, but the change would occur over a longer period of time. There are also more areas proposed for helicopter harvest reducing the area that would be harvested using skyline methods.

Table 3-45: Effects of harvest units and proposed treatements on Scenic Quality in Alternative 3

Units	Proposed Treatment	Range of Canopy Cover (percent)	Seen from Critical Viewpoint?	Forest Plan Visual Quality Objective
U.S. Highway 12 – 101, 102, 103, 143, 144	Fire Salvage	Varies depending existing dead and dying vegetation	Yes; U.S. Highway 12, Three Devils Picnic Area, Wild Goose Campground, and the confluence interpretive site.	Retention in the foreground, partial retention in the middleground and modification in the background
Selway River Road – 103,104,126, 145	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	Yes; the Selway River road, Johnson Bar Campground, Fenn Ranger Station and VC, CCC Trailhead and O'Hara Campground.	Retention in the foreground, partial retention in the middleground and modification in the background
Swiftwater Road and Lookout Butte - 104, 105, 106, 107, 109, 109, 110, 111, 112, 113, 114, 115, 136, 137, 138, 139, 140142	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation. Areas affected are larger and more prevalent in this drainage.	Yes; from Road 470 and the Lookout Butte access road.	Partial Retention in the foreground and Modification in the middle and background
Misc. roads and trails within the Elk City and Goddard Creek drainages – 117, 118, 119, 120, 121, 122, 123, 124, 125, 127, 128, 129, 130, 131, 132, 133, 134, 135	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	No; activities viewed from minor roads and trails	Modification

3.10.8.1.5 Alternative 4

This alternative is very similar to Alternative 2 and 3. Harvest activities have been reduced with the elimination of units 101, 102, 143, and 144 within the viewshed of U. S Highway 12. Within the Selway River viewshed unit 116 would be greatly reduced and unit 126 would be eliminated. These units are within the *Retention* VQO. There was still fire activity within the area of the unit so it still may appear as an opening as the fire damaged trees die and fall to the ground, but the change would occur over a longer period of time. There are fewer areas proposed for helicopter harvest and the area harvested using skyline methods would be increased.

Table 3-46: Effects of harvest units and proposed treatments on Scenic Quality in Alternative 4

Units	Proposed Treatment	Range of Canopy Cover (percent)	Seen from Critical Viewpoint?	Forest Plan Visual Quality Objective
U.S. Highway 12 – 103	Fire Salvage	Varies depending existing dead and dying vegetation	Yes; U.S. Highway 12 at the confluence interpretive site.	Retention in the foreground, partial retention in the middleground and modification in the background
Selway River Road – 103,104,116, and 145	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	Yes; the Selway River road, Fenn Ranger Station and VC, CCC Trailhead and O'Hara Campground.	Retention in the foreground, partial retention in the middleground and modification in the background
Swiftwater Road and Lookout Butte - 104, 105, 106, 107, 109, 109, 110, 111, 112, 113, 114, 115, 136, 137, 138, 139, 140, and 142	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation. Areas affected are larger and more prevalent in this drainage.	Yes; from Road 470 and the Lookout Butte access road.	Partial Retention in the foreground and Modification in the middle and background
Misc. roads and trails within the Elk City and Goddard Creek drainages – 117, 118, 119, 120, 121, 122, 123, 124, 125, 127, 128, 129, 130, 131, 132, 133, 134, and 135	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	No; activities viewed from minor roads and trails	Modification

3.11 Weeds

3.11.1 Analysis Area

The analysis area for this noxious weed assessment includes approximately 13,000 acres of National Forest Service managed lands, all of which occur across drainages in the Middle Fork Clearwater River and Lower Selway Watersheds, more specifically, Decker, Swiftwater, Elk City, Goddard and O'Hara creeks.

3.11.2 Regulatory Framework

Analysis and evaluation of noxious weeds in this project is based on direction contained in the Federal Noxious Weed Law (1974) as amended (1975), Executive Order13112 for

Invasive Species. Forest Service Policy (FSM 2080.5), Nez Perce National Forest Plan (II-7, II-20, II-26 ,III-6), and Idaho State Noxious Weed Code (title 22, chapter 24).

In general, the Forest is directed to implement an effective weed management program with the objectives of preventing the introduction and establishment of noxious weeds; containing and suppressing existing weed infestations; and cooperating with local, state, and other Federal Agencies in the management of noxious weeds.

3.11.3 Analysis Methodology

This assessment addresses the presence of noxious weeds relative to expansion risk, susceptible habitats, and spread vectors. The effects are considered within the Johnson Bar Salvage Project.

Susceptible Habitats

Habitats were classified as having low, moderate, or high susceptibility based on habitat type group (HTG) characteristics and known ability of weeds to colonize in these habitat types. Highly susceptible habitats can be colonized and dominated with exotic plants even in the absence of intense and frequent disturbances. HTGs with a low rating are only slightly susceptible to weed colonization.

Weed Expansion Risk

The risk of weed expansion was determined by assessing the following factors; susceptibility of habitat type groups (HTGs), the presence of weed infestations (seed source), the amount of fire and harvest activity (site disturbance), and the density of roads (spread vectors). Weed risk is the indicator of weed expansion in the project area. Geographic Information Systems (GIS) data were used to display and calculate acres of activities occurring in each weed expansion risk zone.

While it is well known that risk of weed invasion increases with disturbance and is variable depending on specific habitats, management activities and variable seasonal climate, making exact determinations of weed response would be extremely difficult if not impossible. In any scenario, the best predictions of weed response would be based upon local parameters of the particular project area. The weed risk model used by the Nez Perce National Forest is based upon local habitats, weed occurrences, disturbance levels, and available vectors. The logic and framework that this model has been based upon has been widely respected and adapted for a broader regional-level prediction model sanctioned by the Region One office of the U.S. Forest Service.

Exotic Plant Inventory Data

Inventory of existing exotic plant populations has been ongoing in the project area for several years. Surveys have been conducted, but generally these have been of limited scope. Where noxious weed populations have been documented, treatments have occurred and the data is accurate and reliable.

A noxious weed assessment/survey was conducted during the first week of September 2014 by Forest Service personnel, as part of the Johnson Bar Fire B.A.E.R. (Burned Area

Emergency Response) Team, by driving all roads and observing any invasive species currently growing within the fire perimeter. No large, continuous populations of weeds were documented, only small and scattered satellite groups, mostly confined to the road right-of-ways, in ditches and along the disturbed cut banks. Two noxious weed species from the Idaho State List, Spotted knapweed and Canada thistle, were found growing within the proposed project area transportation corridor along Forest Service Roads: #470, #470B, #470C, #470D, #1121, #9701, #9723, #651, #1119, and #1119A. Noxious weed control with herbicides was recommended and funded to treat all existing, along with any new invader infestations within the Johnson Bar Fire Perimeter during the Spring and Fall seasons of 2015. Weed monitoring was also recommended and funded for populations within and adjacent to the fire, to determine if any increases in densities occur, along with post treatment monitoring effectiveness.

3.11.4 Resource Indicators

Weed expansion risk in the analysis area was determined by assessing the susceptibility of habitat type groups, the presence of weed infestations (seed source), the amount of recently burned or harvested areas (site disturbance), and the density of roads or trails (spread vectors). The largest portion of the analysis area is dominated by the Idaho Batholith Breaklands, a local landtype classification or Vegetative Response Unit. VRU 8 (Stream Breaklands) is characterized by relatively warm/moist Western red cedar and Grand fir habitat types. These habitat types are moderately susceptible to weed colonization. Cooler grand-fir and mixed conifer habitats which occur over the rest of the Breaklands and all of the Uplands (VRU 10and17) tend to be moderate to low with regard to weed expansion risk. Areas at risk to expanding weed populations were calculated using GIS data and the following results were given for the Johnson Bar Analysis Area.

Acres and Expansion Risk Probability Percent

High	Moderate	Low to Closed
910 (7%)	11,700 (90%)	390 (3%)

Approximately 3% of the project area habitat can be characterized as having a low or closed susceptibility to invasive plants, these are the hardened road surfaces, water and gravel. Moderately susceptibly habitats encompass about 90% of the project area in the moist low elevation canyons, while highly susceptible habitats make up only 7% (these tend to be southern exposures along the dry open slopes). Overall, the project areas can be characterized as having a mostly moderate to low susceptibility to invasive plants, with moderate areas making up the largest majority of acres within the proposed Johnson Bar Fire Salvage area.

3.11.5 Affected Environment

Idaho’s noxious weeds are plant species that have been designated “noxious” by law in the Idaho code (title 22, chapter 24, “Noxious Weeds”). There are currently 64 Noxious Weeds on the state List. These 64 weeds are separated into three Categories based on the level of concern, which affects how they are managed. **Statewide Early Detection Rapid Response**

EDRR category is top priority, as these are the new invaders and pose the greatest risk. No weeds in this category are in the project area. The next level is **Statewide Control**, these plants can be eradicated, but in most cases they are managed to reduce the infestations within 5 years. No weeds in this category are known to exist in the project area. The last category is **Statewide Containment**, most plants in this category are established populations and managed locally depending on the size and density of the infestation. Current noxious weed inventories in the analysis area identify 2 species form the Statewide Containment Category, Spotted knapweed (*Centaurea stoebe*) and Canada thistle (*Cirsium arvense*) as the most widespread. These two weed species can be found primarily along roads and in the open, drier habitats within the project area. Two other weed species on the Statewide containment Category Houndstongue (*Cynoglossum officinale*) and Oxeye Daisy (*Leuxanthemum vulgare*) also exist in small numbers within the analysis area, but are not inventoried. These last 2 species are sporadically dispersed throughout the entire Moose Creek District, mostly by animals, and rarely occupy continuous areas, which makes mapping almost impossible.

Currently the Moose Creek Ranger District conducts integrated weed management strategies that deal with weed infestations within the project area based on priorities outlined in the Annual Operating Plan for the Clearwater Basin Weed Management Area, a community based cooperative (CBWMA). The area has and would continue to receive high priority for invasive weed control work prior to and throughout the life of the proposed project. Noxious weed treatments are currently conducted with crews from the Forest Service, County, Private Contractors, and Idaho Backcountry Horseman. Monitoring and inventory of these weed populations would occur in conjunction with these treatments.

Weed expansion in the analysis area is greatly influenced by habitat susceptibility, seed availability, seed or propagule dispersal, and habitat disturbance. The probability that weeds would expand in the project area depends on the interaction of these four factors. Weed expansion begins with the dispersal of seed from existing weed infestations adjacent to uninfested areas. Roads and trails are the primary means by which people and animals interact with the environment and therefore are an important spread vector. These linear corridors act as dispersal networks for exotic plants. The majority of documented infestations within the analysis area are along the transportation corridors.

Disturbance creates spatial and temporal openings where sites become suitable for plant establishment, and where usable light, space, water and nutrients are available to meet the specific growing requirements of the plant. Disturbance may increase the susceptibility of an otherwise intact plant community to weed invasion by increasing the availability of a limited resource. Natural or human caused fires along with timber harvest and grazing are broad scale disturbances that influence the amount of available habitat for weed establishment.

3.11.6 Direct and Indirect Effects

3.11.6.1 Alternative 1

Under this alternative, management practices and use of the project area would continue under current management, with no further actions proposed. The risk of noxious weed expansion would continue at current levels.

3.11.6.2 Alternatives 2, 3, and 4

All of the action alternatives have the potential to spread weeds to some degree because of ground disturbing activities associated with Timber Harvest and Temporary Road Construction. The risk of noxious weed introduction is greater when the proposed project activities are within close proximity to existing infestations and a seed source. The level of expansion depends directly on how well design criteria are followed. Pioneering weeds such as thistles can be initially expected to occur in any burned areas with bare soil. Accurate data on exactly how fast each weed species would spread in response to ground disturbing actions is not available as weed models do not distinguish between differing categories of disturbance. It is estimated, however, that 1 to 10 percent of the activity acres would experience weed establishment following treatments. With rigorous application of design criteria and monitoring, the expansion would be closer to 1 percent. With poorly implemented design criteria, expansion would be closer to 10 percent.

Of the action alternatives, Alternative 2 would result in the most disturbed acres (2,973) and the greatest potential for weed expansion. Alternative 4 at 2,298 acres would have the least potential to spread weeds, and Alternative 3 would be somewhere in between at 2,580 acres. The difference between the 3 action alternatives is minor when it comes to total acres of disturbance, therefore the relative risk of weed expansion in the proposed project area would be somewhat similar for all three. This is a relative ranking of Alternatives based on total acres of disturbance. It is recognized that the actual treatment acres or actual amount of ground disturbing activity would likely be less than the gross acres displayed.

Levels of herbicide application would be expected to increase initially under all action alternatives as existing weed populations are treated and design criteria for other activities are developed and implemented. Alternative 2 would carry the highest levels of potential herbicide application. Assuming weed management actions are effective, herbicide application levels would taper off over time. Complete eradication of all weeds would not be attainable under any alternative. Weeds such as Spotted knapweed and Canada thistle would be contained and managed locally.

3.12 Wild and Scenic Rivers

3.12.1 Analysis Area

The Johnson Bar Fire Salvage project Area is located south of the Middle Fork Clearwater River and west of the Selway River near the confluence of the Selway and Lochsa Rivers. The Analysis Area for the Wild and Scenic River includes that portion of the Wild and Scenic

River within the Project area plus the adjacent Wild and Scenic River area located on the opposite side of the river.

3.12.2 Regulatory Framework

3.12.2.1 Wild and Scenic Rivers Act

The project area includes a portion of the Middle Fork Clearwater (including the Lochsa and Selway Rivers) Wild and Scenic River. This river is managed consistent with its designation in accordance with PL 90-542, as amended, and 16 U.S.C. 1271-1287.

Management direction is found in Section 10(a) of the Wild and Scenic Rivers Act:

> *Each component of the national Wild and Scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other such uses that do not interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting* ***aesthetic, scenic, historic, archaeologic, and scientific features****. Management Plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.*

The Middle Fork Clearwater Wild and Scenic River has a River Plan as required by the Wild and Scenic Rivers Act (Section 3) and outlines site specific management direction for the river corridor. Management Guides and a River Management Plan were prepared in 1973 and 1969 respectively, to guide management of the river corridor. The proposed project would be in compliance with the Forest Plan and River Plan standards.

There are no other eligible Wild and Scenic Rivers within or adjacent to the Johnson Bar Salvage area.

3.12.3 Analysis Methodology

Effects to the Wild and Scenic River resources are based on effects to:

- Identified outstandingly remarkable values (ORVs),
- Free flow,
- Consistency with the applicable River Plan, and
- Consistency with the Nez Perce Forest Plan.

The proposed project does not propose any activities within the normal highwater of the Selway or Middle Fork Clearwater Rivers or their tributaries located within the designated boundaries of the Wild and Scenic River. Free flow would not be affected by this project and is not discussed in detail.

The identified ORVs for the Middle Fork Clearwater Wild and Scenic River are:

- Scenery

- Recreation
- Geology
- Fish
- Wildlife
- Historic and Cultural
- Water Quality
- Vegetation/Botany

All of the ORVs have been addressed in other resource reports except Geology. This project would not affect the underlying geology or any geologic features within the project area and therefore is not discussed in detail. This report summarizes the findings in context of Forest Plan and River Plan consistency.

3.12.4 Resource Indicators

The resource indicator is consistency with the River Plan and Forest Plan. There are no specific metrics to be evaluated.

3.12.5 Affected Environment

There are approximately 21,600 total acres within the designated boundaries of the Middle Fork Clearwater Wild and Scenic River. This land area is identified as Management Area 8.2 in the Nez Perce Forest Plan (pages III-19 to 21). A portion of the Middle Fork Clearwater Wild and Scenic River System is located within and adjacent to the project area. Approximately 2,100 acres of designated river corridor would be located within the proposed project area and another 2,000 acres are adjacent (Map 1).

The existing condition of the individual ORVs is contained within the sections for those specific resources:

- Scenery is addressed in the Visual section
- Recreation is address in the Recreation and Trails section
- Geology is not addressed
- Fish are addressed in the Fisheries section
- Wildlife are addressed in the Wildlife section
- Historic and Cultural are addressed in the Cultural section
- Water Quality is addressed in the Fisheries, Hydrology, and Soils sections
- Vegetation/Botany is addressed in the Fuels, Vegetation, Botony, and Weeds sections

Approximately 1,300 acres (60% of the acres within the designated boundaries) were burned by the Johnson Bar fire. Most (82%) of those acres were moderate to high severity.

Mixed severity fire burned down to the river on almost the entire length of the river within the project area. Fire effects primarily include burned and downed trees readily visible along the river-edge and throughout the river corridor and potential for increased erosion due to loss of organic matter.

3.12.6 Direct and Indirect Effects

Very few of the projects listed in Table 3-51 (Past, Present and Reasonably Foreseeable Future Projects) have occurred in the designated Wild and Scenic River Corridor. Ongoing road and trail maintenance, the presence and operation of campgrounds and administrative sites all occur within the corridor. Other projects that have occurred within the corridor and adjacent to the project area include Bridge Creek Timber Sale (2009), Interface Fuels Timber Sale (2012), and the transport of oversized loads on US Highway 12. Bridge Creek and Interface Fuels projects conducted timber harvest and used Wild Goose and Two Shadows helicopter landings. Both projects implemented design criteria to protect river resources, and did so successfully. Future projects with potential activities within the corridor include Lowell WUI, Fenn Face, and North Selway Face. These future projects also include design criteria for protecting river resources.

While direct effects to river resources have been minimized with design criteria, there has been a cadence of short-term activities occurring in the corridor that could be perceived as industrial intrusion within the otherwise pastoral environment, particularly the use of helicopter landings and the transport of oversized loads on US Highway 12. Vegetation treatments have been minor, well less than 1% of the river corridor in the past decade. Decreased forest health and increased insects and disease are evident that may warrant future management action.

Forest-Wide Standards **Wild, Scenic and Recreation Rivers (Forest Plan pg. II-22-23)**		
1	Maintain or enhance the recreation, visual, wildlife, fisheries, and water quality values of the existing and proposed "Wild," "Scenic," and "Recreation" Rivers.	Design criteria developed for the Johnson Bar Fire Salvage project would provide adequate protections for these resources. In most cases the project would have no effect or no adverse effect. Impacts to recreation would be temporary and primarily associated with log haul on main roads within the corridor (Selway Road 223 and US Highway 12). Use of helicopter landings within the corridor would be limited to avoid the high recreation use periods. Impacts to visual resources would be primarily associated with Units 103 and 104 located near the confluence of the Lochsa and Selway Rivers. Design criteria would assure the visual quality objectives established for those areas would be met. Impacts to Wildlife and Fish habitat and populations would not be adversely affected (see Wildlife and Fisheries reports). Water quality within the Selway and Middle Fork Clearwater Rivers would not be adversely affected (see Fisheries, Hydrology and Soils Reports).
3	Generally, no management practices are scheduled in the waterway corridors which are normally defined as the seen area up to ¼ mile either side of the channel.	The Johnson Bar Fire Salvage project proposes approximately 170 acres of harvest within the designated river corridor with Alternatives 2 and 3 with the following harvest units: Unit Acres w/i WSR 102 2 103 103 104 46 126 12 143 2 145 8 About 150 acres would be harvested with Alternative 4 with the following harvest units: Unit Acres w/i WSR 103 103

		104 46 Portions of these units would be seen and have been addressed in the Scenery Management report. Design criteria assure the visual quality objectives would be met. See also Management Area 8.2 Timber standards below.
4	New road construction and timber harvest are excluded in the “Wild” River Corridors, and very limited in ”Scenic” and “Recreation” River Corridors.	No new roads are proposed within the designated corridor. See Forest-wide Standard #3 above for a description of the limited harvest proposed in the Recreation corridor.
6	Manage for recreation experiences in context with the existing or proposed designation. "Wild" - primitive or semiprimitive nonmotorized. "Scenic" - semiprimitive motorized or semiprimitive nonmotorized. "Recreation" - semiprimitive motorized or roaded natural.	The portions of WSR within the project area are classified as Recreational. The Recreation and Trails report describes the existing Recreation Opportunity Spectrum and that there would be no effect or change to ROS.
Management Area 8.2 Standards (Forest Plan pg. III-19-21)		
Recreation 2	Recreation Segment: Manage for roaded natural appearing or semiprimitive motorized recreation.	See Forest-wide Standard #6.
Recreation 4	Identify and protect historic, scenic, geologic, and archaeological sites.	The Cultural Resources report identifies historic and archeological sites that require protection. Design criteria for the project require that these sites be avoided, therefore they are protected. The Scenery Management report addresses the visual impacts of harvest within the WSR corridor. Design criteria would assure Visual Quality Objectives are met. No geologic sites are in the project area.
Recreation 5	Recreation Segment: Manage for retention visual quality objective.	The Scenery Management report addresses how Retention VQOs would be met for the harvest units located within the WSR corridor.
Wildlife and Fish 1	Restore degraded anadromous and resident fish habitat.	See Fisheries report. The Forest Plan Appendix A requires an upward trend in habitat conditions for certain watersheds in the project area. A suite of road

		decommissioning projects would lend progress toward the required upward trend. None of those projects, however are located within the WSR corridor.
Timber 1	Lands are classified as "unsuitable" for timber management; do not schedule timber harvest.	The Johnson Bar Fire Salvage project was not scheduled as part of the annual sale quantities. This project is in direct response to the wildfire and opportunities to respond to landscape conditions.
Timber 2	Recreation Segment: Exclude timber harvest except for (a) public safety and/or recreational purposes in selected areas; (b) **control of fire, insects and disease** when such cutting is the only practical method of control; (c) approved access facility locations.	The Fuels and Silviculture reports reveal the potential for portions of the project area to reburn if no action is taken to address the existing burned timber. The Johnson Bar Fire Salvage is designed to address future fire control issues associated with increased fuel load caused by the wildfire.
Water 1	Meet established fishery/water quality objectives for all prescription watersheds as shown in Appendix A.	See Wildlife and Fish Standard #1 above
Facilities 3	Recreation Segment: Maintain or reconstruct [trails] to enhance recreation values, user safety, and reduce environmental damage.	See Recreation and Trails Report. Portions of two trails (706 and 712) are located within the WSR Corridor. The portion of Trail 706 within the WSR corridor is located on State land without a trail easement. It is unknown whether the trail would be reconstructed. The portion of Trail 712 located within the WSR Corridor would not be affected by harvest activities and would be maintained on an infrequent basis.
Protection 1	Recreation Segment: Treat infestations [of insects and disease] that threaten recreation values or adjacent "suitable" or private lands.	The Johnson Bar Fire Salvage project is not designed to address existing or potential future insect and disease populations. Indications are that the fire itself burned over many of the insect population areas that existed prior to the fire. Increased insect populations are not expected with No Action or any of the alternatives.
River Plan **General Coordinating Requirements (River Plan pg 5-10)**		
Recreation 4	Identify and protect historic, scenic, geologic, archaeologic and similar sites or areas.	See Management Area 8.2 Recreation #4 above.
Timber 1	Consider timber for recreation, watershed protection and esthetic values rather than for commercial	Approximately 1,300 acres of the 2,100 acre Wild and Scenic River Corridor was burned. Alternatives 2 and 3 proposed to

	production.	harvest about 170 acres or 13 percent of the burned area and Alternative 4 would harvest about 150 acres or 11 percent of the burned area. Approximately 90 percent of the burned area would be retained untreated to provide trees on the landscape for other purposes. These burned trees will likely fall down over the course of the next few years and may contribute to increased risk for re-burn. See Fuels Report.
Timber 2	Commercial timber harvest will generally be confined to areas outside the boundaries of the river area. Commercial operations could be needed to meet objectives under recreational river coordinating requirements.	See Recreation River Coordinating Requirements Timber #1 below.
Water 2	Protection of rivers will include controlling pollution, debris accumulation and siltation to the degree necessary to maintain the water quality within defined parameters or measurable units.	See Management Area 8.2 Wildlife and Fish Standard #1 above.
Transportation 2	Locate roads and trails to avoid encroachment on river banks and to harmonize with objectives for which the river area is established.	No new roads or trails would be constructed in the WSR Corridor.
River Plan **Recreation River Coordinating Requirements (River Plan pg 10 - 14)**		
Timber 1	Timber cutting will be done only for the following: a) Public safety and/or recreational purposes in selected areas. b) Control of fire, insects and disease when such cutting is determined to be the only practical method of control. c) [with]Approved road and trail locations.	See Management Area 8.2 Timber #2 above.
Timber 2	Timber cutting will be compatible with or enhance key recreational and scenic values	See Forest-wide Standards #1 above.
Timber	The value of standing trees for	Approximately 1,300 acres of the 2,100

3	watershed, aesthetic or other recreational purposes will be considered in the choice of measures for controlling fire, insects and disease.	acre Wild and Scenic River Corridor was burned. Alternatives 2 and 3 proposed to harvest about 170 acres or 13 percent of the burned area and Alternative 4 would harvest about 150 acres or 11 percent of the burned area. Approximately 90 percent of the burned area would be retained untreated to provide trees on the landscape for other purposes. These burned trees will likely fall down over the course of the next few years and may contribute to increased risk for re-burn in about 20 years. See Fuels Report.
Water 2	Coordination with all agencies, State and Federal, private landowners and water users will be necessary to protect water quality.	See Management Area 8.2 Wildlife and Fish Standard #1 above.
Water 3	Modify projects within the river system if necessary to insure high water quality	See Management Area 8.2 Wildlife and Fish Standard #1 above.
Water 4	Gullied, eroding stream, polluted water and vegetation and soil disturbed by humans, domestic animals, wildlife, large burns and landslides are examples of undesirable watershed conditions in classified river areas. Where these conditions have a major impact on river values they should be restored.	See Silviculture Report. See Scenery Management Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternative 2, 3 and 4 would harvest then plant jump starting tree recovery.
Water 5	All watershed improvement projects will be designed as to location, type of treatment and work methods to insure compatibility with the free-flowing intent of the Wild and Scenic Rivers Act.	No projects are proposed that would affect free-flow.
Wildlife and Fish 1	Provide an appropriate habitat to sustain a variety of wildlife for public enjoyment	See Wildlife Report. No adverse effects to any wildlife population or habitat component is anticipated.
Management Guides Guidelines (pg 32 – 43)		
Recreation 12	Shorelines must remain essentially primitive in Wild River zones and fully protected within the Recreation River zone.	Design criteria for the project include PACFISH buffers on stream-side zones. No harvest is proposed within 300 feet of the Selway or Middle Fork Clearwater River.
Timber 1	Timber cutting in the Recreation River areas will be for recreation, fire control, and for other essential management purposes rather than for commercial	See Silviculture Report. See Fuels Report. One of the objectives of harvest is to

	production.	accelerate the rate of tree recovery over natural processes (no action). Alternative 2, 3 and 4 would harvest then plant jump starting tree recovery. See also River Plan Recreation River Coordinating Requirements Timber #3 above.
Timber 3	Timber harvest and any other vegetative changes in the Recreational River zone are to be directly toward maintaining a viable, attractive forest environment.	See Silviculture Report. See Scenery Management Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternative 2, 3 and 4 would harvest then plant jump starting tree recovery.
Timber 4	When cutting is necessary, the actual cutting practices are to be determined on an "area by area" basis. A thorough analysis of stand conditions, soils, topography, and especially the impact on scenery and other recreational values will be required in each case. The following general requirements apply: a) Cutting units are to be designed to avoid large openings in the canopy unless such openings will enhance the landscape. b) Treat all slash and debris promptly and completely to reduce the hazards of fire, insect and disease and to protect visual values. c) Control; timber harvest methods that leave the least possible visual impact. Avoid locating logging roads and skid trails within river boundary viewing areas. d) Special measures will be provided for intensive slash cleanup on or adjacent to occupancy sites or developments e) The above requirements favor logging systems that have a	a) Design criteria for meeting visual quality objectives would result in no large openings within the Wild and Scenic River Corridor. b) Design Criteria provide for timely treatment of slash and debris. Some slash would be intentionally left within harvest units to provide cover and protection of soils. See Soils Report. c) See a above. No roads or skid trails would be located within the WSR corridor. d) Design criteria require intensive clean up and rehabilitation of landings located at Two Shadows, Wild Goose and Johnson Bar. e) Alternatives 2 and 3 would harvest approximately 170 acres within the WSR corridor. 93 acres would utilize helicopter logging methods and about 80 acres would utilize skyline logging methods. There would be no tractor logging within the WSR corridor. Alternative 4 would harvest approximately 150 acres within the WSR corridor. 70 acres would utilize helicopter logging methods and about 80 acres would utilize skyline logging

	minimum effect on the natural appearing forest as viewed by the traveler along the river or from a vista area. Utilizing helicopter, skyline, and horse logging.	methods. There would be no tractor logging within the WSR corridor
Timber 5	Reforestation or other planting in the absence of natural revegetation shall be carried out where necessary to restore landscape appeal and protect watershed values.	See Silviculture Report. See Scenery Management Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternative 2, 3 and 4 would harvest then plant jump starting tree recovery.
Timber 6	Timber stand shall be kept as healthy as possible both to protect the zone and to protect adjoining lands.	See Silviculture Report. Insect and disease processes are evident in the project area and throughout the WSR corridor. Future management actions will need to be explored to assure healthy forests over time.
Timber 7	Require timely erosion prevention measures wherever timber is cut. Funds to minimize erosion will be provide for all timber sales and in the amount needed for maximum control.	See Soils Report. See Hydrology Report. Design Criteria for the project would assure implementation of Best Management Practices to minimize erosion.
Water 3	It will be necessary to restore areas where watershed deterioration is in evidence due to prior activities of man, flood conditions, domestic livestock, wildlife, fire or land slides. Interdisciplinary planning teams are to be utilized to plan these projects.	See Silviculture Report. See Scenery Management Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternative 2, 3 and 4 would harvest then plant jump starting tree recovery.
Water 8	Individual projects may require modifications to insure maintenance of desired water quality. Modifications will be made when it has been determined that such uses or activities cannot be made compatible with the river.	See Management Area 8.2, Wildlife and Fish Standard #1 above.
Wildlife and Fish 1	Provide for the perpetuation of the anadromous fishery in all project plans	See Fisheries report. No adverse effects to the anadromous fishery is anticipated.
Soil 1	Special soils studies and evaluations will be required whenever attempting complex projects or developments within the River system boundaries.	See Soils report.
Soil	Revegetation projects, providing a	See BAER report. Following the Johnson Bar

2	protective soil cover crop, will be required for all applicable projects and following large fires.	fire mulching and seeding was considered with Burned Area Emergency Rehabilitation efforts but deemed unnecessary. This project has specific design criteria to retain fine and course woody debris within treatment areas rather than seeding with a cover crop. This woody debris would protect soils from erosion. See Hydrology Report.
Fire Control 6	Provide for the restoration of fire damage immediately after the fire is controlled. Include mulching and planting of fire lines and other erosion measures as necessary and appropriate within each river class.	See BAER report. Fire lines, drop points and roads used for fire suppression efforts were rehabilitated immediately following the fire. See Soil #2 above.
Management Guides Prescriptions (pg 44 – 54)		
Recreation 2	Project activities which create noise, dust, air pollution, etc., are to be restricted or otherwise controlled. Special project constraints will be required during the recreation season.	See Forest-wide Standards #1 above
Timber 1	Timber management programs within the river boundaries are to be directed at the maintenance of an attractive forest environment. An attractive forest environment is defined as the associated external factors; flora, fauna and etc., which in total make the river system a pleasing experience to the visitor. It can include many vegetative types and open areas if in total these features add beauty to the landscape and protect its soils, waters, and wildlife.	See Silviculture Report. See Scenery Management Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternative 2, 3 and 4 would harvest then plant jump starting tree recovery.
Timber 2	Forest management on the river is to be directed at sustaining a balanced vegetative cover suited to environmental, aesthetic and wildlife purposes.	See Scenery Management Report. See Wildlife Report. See Silviculture Report.
Timber 3	Management emphasis on the river lands suited to timber production will not be on the reforestation of cutover or denuded tracts, but on sustaining a vegetative cover on the landscape.	See Management Guides – Prescriptions, Timber #1 above.

Timber 4	Selective cutting and shelterwood silvicultural methods will be used.	See Silviculture Report. Design criteria for meeting visual quality objectives would result in silvicultural systems with variable retention levels however the goal would be to regenerate harvest areas through planting.
Timber 6b	Modify timber management practices …to meet or enhance aesthetic and recreational values.	See Forest-wide Standard #1 above.

3.13 Wildlife

3.13.1 Analysis Area

The Project Area includes 26,788 acres and supports various wildlife species. The latest fire has affected habitat for those species in the area.

The following wildlife section would show analysis on individual species that may be considered rare, or their population trend may be declining, and other species that represent wildlife in specific types of forest habitats. Direct, indirect, and cumulative effects consider a species occurrence in a project area, habitat requirements, habitat availability, and habitat quality for the analyzed species. In most cases, the direct, indirect and cumulative effects analysis area is the 26,788-acre project area, which includes all proposed activity areas. It is large enough to assess the effects of proposed activities, but not so large as to make habitat changes undetectable. Effects were based on the acres of potential habitat treated by proposed activities. The timeframe for direct and indirect effects is 5 years (unless otherwise stated), which is the estimated time needed to complete harvest activities. Cumulative effects may range up to 150 years for stands to develop mature or old growth characteristics that are preferred by some of the wildlife species analyzed in this report. For old-growth and elk, predetermined analysis units were used as required by Regional or Forest Plan direction. There are 6 old growth analysis areas and 3 elk analysis areas (EAAs) in the analysis area.

3.13.2 Regulatory Framework

3.13.2.1 Nez Perce National Forest Plan

The 1987 Forest Plan documents goals, objectives, standards, and guidelines for managing Forest wildlife species and habitats. Goals (pages II 1-2) described in the Plan include:

> *Provide/maintain diversity and quality of habitat to support viable populations of wildlife. Support the recovery of ESA listed species or sensitive species by providing habitat of sufficient quantity and quality.*

The Forest Plan objectives (pages II 5-6) are more specific to acres managed for elk, Pacific yew and old growth. Specific wildlife species that were considered rare in the late 1980s were addressed with forest compliance in their recovery. Habitats are to be managed to provide for population viability of sensitive species. Forest Plan standards and guidelines for wildlife (pages II 18-20) outline management, coordination, cooperation and some design considerations that the wildlife program would implement or comply to.

3.13.2.2 Endangered Species Act

This Act directs that actions authorized, funded, or carried out by federal agencies do not jeopardize the continued existence of any threatened or endangered species, or result in the adverse modification of habitat critical to these species. It is also the responsibility of the Forest Service to design activities that contribute to the recovery of listed species in accordance with recovery plans developed as directed by the ESA (50 CFR part 402). Section 9 of the ESA of 1973, as amended, requires threatened and endangered species be protected from "harm" and "harassment" wherever they occur, regardless of recovery boundaries.

The latest list of threatened and endangered species (August 14, 2014) shows the Canada lynx as the only listed (threatened status) terrestrial species on the forest. The analysis area of the salvage project is not located in any lynx habitat or in a Lynx Analysis Area (LAU). Thereby, no lynx habitat would be impacted by project activities. It is determined that all proposed alternatives for the Johnson Bar Fire Salvage project would create no effect to lynx or its habitat. All Action Alternatives are consistent with the Northern Rockies Lynx Management Direction (NRLMD) and are in compliance with the ESA and FSM 2670. Informal coordination with the USFWS on this Project was initiated on December 2, 2014.

3.13.2.3 National Forest Management Act (NFMA, 1976)

This Act requires the Forest Service to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives [16 USC 1604(g)(3)(B)]. The Forest Service's focus for meeting the requirement of NFMA and implementing its regulations is on assessing habitat to provide for diversity of species. All alternatives would be consistent with NFMA direction for diversity of animal communities. Although the Action Alternatives analyzed in the Project may impact individual animals, the Project's proposed activities would not affect the viability of any species across its range.

Sensitive Species: Sensitive wildlife species are those that show evidence of a current or predicted downward trend in population numbers or habitat suitability that would substantially reduce species distribution. Federal laws and direction applicable to sensitive species (SS) include the NFMA and FSM 2670. The Forest is required to determine the potential effect of proposed activities on SS and to prepare biological evaluations. The Forest Service is bound by federal statutes (ESA, NFMA), regulations, and agency policy (FSM 2670) to conserve biological diversity on NFS lands and assure SS populations do not decline or trend toward listing under the ESA. This document fulfills the requirements of the biological evaluation for sensitive species. The Proposed Actions would not affect sensitive species viability on federal lands, nor would it cause SS to become federally listed as threatened or endangered.

Species Viability: The Proposed Action, in combination with past, present, and reasonably foreseeable future management actions in the Analysis Area, would not affect population viability or distribution of native and desired nonnative vertebrate species on the Forest. The Idaho Comprehensive Wildlife Conservation Strategy (IDFG 2015) contains information on species of concern or interest including range-wide and state-wide status and known population information. At the Forest-wide scale, this Project would not disturb, agitate or bother populations to a degree that causes, or is likely to cause, a measurable decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior.

3.13.3 Analysis Methodology

Wildlife analyzed for management actions on the forest include Threatened and Endangered species (identified by the USFWS), Regional sensitive species, management indicator species (MIS) and neotropical migratory birds. The Nez Perce forest has one threatened species, Canada lynx, which is presumed to be on the forest. The USFWS recognizes the Forest as secondary habitat for the predator, as well as unoccupied habitat for threatened Canada lynx. The Nez Perce Forest Plan designated 11 management indicator species (MIS). The Forest Service Northern Region (R1) has identified 22 sensitive species (SS) that are suspected or known to be on the Forest. Wildlife analyses include the baseline conditions (created by all past management practices and natural events); direct, indirect and cumulative effects of the proposed actions; and cumulative effects of reasonably foreseeable projects. Region, Forest, local, and Idaho Fish and Game records were consulted on presence of species in the Project area. Modeled vegetation layers (from GIS applications) were used for interpretation of species habitats or potential habitat for the animals' life stages. Data related to model vegetative features as potential habitat include species, age, size, density, canopy cover and harvest history: queried from GIS layers containing database information from TSMRS, FSVEG, VMAP and FACTS.

Table 3-47 displays the habitat criteria used to identify suitable habitat for most species. Suitable habitat considered includes areas that would be necessary for breeding, nesting, rearing, and foraging activities. Suitability is based on stand characteristics such as tree species, tree size, and tree canopy cover. Other habitat quality considerations include patch size, snag numbers and size, downed wood, riparian habitat, and security areas. Stand criteria used to assess species' habitat suitability were obtained from peer-reviewed technical literature on species specific research. Some species are not necessarily dependent on coniferous trees for their habitat needs: American peregrine falcon, black swift, Coeur d'Alene salamander, common loon, harlequin duck, long-billed curlew, North American wolverine, and Townsend's big-eared bat. These species are not described in the following table.

Table 3-47: Habitat Criteria Used To Identify Suitable Wildlife Habitat in the Analysis Area

Wildlife Species	Primary Tree Species[a]	Tree Diameter (inches dbh)	Tree Canopy Cover (%)	Age Class (years)	Suitable Habitat (Acres)
Canada Lynx (Threatened)	Denning Foraging	–	–	–	0 0
American Marten	SAF, S, LLP, GF, WRC	-	>17	>100	19,253
Bald Eagle	All mature Species, near open water	>20	20-60	>100	3,648
Bighorn Sheep	All Species w/ openings	-	-	-	0
Black-backed Woodpecker	PP, DF, WL, LPP, S, diseased or burnt	>10	>40	>40	13,244
Flammulated Owl	PP, DF	>12	35-70	>80	854
Fisher	WRC, GF, DF, S	>10	>40	>100	20,266
Fringed Myotis	PP, DF	>12	<80	>100	626
Gray Wolf	All	-	-	-	26,000+
Long-eared Myotis Long-legged Myotis	All Species	>12	<80	>100	3,143
Mountain Quail	All Habitats in VRU 3	-	-	-	192
Northern Goshawk Nesting	PP, DF, WL, LPP, GF, WWP	>13	>35-70	>50	15,956
Pileated Woodpecker Nesting	PP, WL, DF, WWP, GF, WRC	>15	>15	-	2,177
Pygmy Nuthatch	PP	>15	25-60	>80	20
Ringneck Snake	VRU 3	–	–	–	192
Western Toad	RHCAs	All	<30	–	4,621
White-headed Woodpecker	PP	>15	25-40		0.5
Shiras Moose Winter (MA 21)	Mapped MA 21	–	–	–	810

[a] PP- ponderosa pine; DF- Douglas-fir; WL-Western larch; WWP-Western white pine; LPP- Lodgepole pine; GF- grand fir; WRC- Western redcedar; S- Englemann spruce; SAF- Subalpine fir

Habitat status and population viability at the Forest level is presented for some species based on Forest Service Northern Region analyses (Samson 2006; Bush and Lundberg 2008). This provides a broader scale context relative to the Analysis Area.

This analysis uses the best available science to assess effects. Data related to vegetative features model potential habitat, including species, age, size, density, canopy cover, and harvest history were taken from the various databases. ArcMap GIS was used for modeling, mapping, and quantifying habitats and Project impacts. National Agricultural Imagery Program (NAIP) images were used to validate information gathered from other sources.

The Idaho Comprehensive Wildlife Conservation Strategy (ICWCS 2015) is a storehouse of sensitive or rare wildlife species survey and observation data. ICWCS data was mapped within the Project area boundary to identify sensitive species potentially using the Analysis area. Some of the IDFG maps were last completed in 2005. Additional wildlife sightings from federal and state historical records were used in this section.

Population trend information for elk and wolf was synthesized from data available from the Idaho Department of Fish and Game research reports.

This analysis incorporates the effects on terrestrial sensitive species and fulfills the requirements of the required Biological Evaluation, per direction pertaining to the FSM and streamlining process (USDA Forest Service 1995). The streamlined process for doing biological evaluations for sensitive species focuses on the following two areas:

- Incorporating the Effects on Sensitive Species into the NEPA Document
- Summarizing the Conclusions of Effects of the Biological Evaluations for Sensitive Species

The following Regional Forester sensitive species and MIS may occur or be affected by proposed activities in the Project area: American marten, bald eagle, black-backed woodpecker, fisher, flammulated owl, fringed myotis (bat), gray wolf, long eared myotis, long-legged myotis, northern goshawk, pileated woodpecker, Rocky mountain elk, and Shiras moose.

3.13.3.1 Species Dropped from Detailed Analysis

The following species were dropped from detailed analysis as suitable habitat is not present, or the project would not affect individuals or their habitats: American peregrine falcon, black swift, Canada lynx, Coeur d' Alene salamander, common loon, grizzly bear, harlequin duck, long-billed curlew, mountain quail, north American wolverine, pygmy nuthatch, ringneck snake, Townsend's big-eared bat, yellow-billed cuckoo, western toad and white-headed woodpecker. Appendix E includes a table displaying these animals and the reasons why they were not further analyzed.

3.13.4 Affected Environment

3.13.4.1 Region 1 Sensitive Species

3.13.4.1.1 Bald Eagle

There are approximately 4.5 miles of the Middle Fork of the Clearwater and 7 miles of the Selway River that flow along the boundary of the project area. Estimated potential bald eagle habitat is approximately 3,650 acres. No occupied nests have been detected along these river stretches for the past few years. One observation detected a pair of eagles on a nest about one and a half miles west of the project boundary in 2014. Three eagles were seen along the Middle Fork of the Clearwater River and boundary of the area during the 2015 winter bald eagle count. One eagle was observed (near present unit 145, about ½ mile from river) during 2013 by a forest wildlife crew.

The Johnson Bar event was a mixed severity fire. Most of the burned areas near the rivers were low to moderate severity, but some isolated patches of high severity occurred. The latter intensity would kill all the trees, leaving snags, scorched soil, and openings as the snags fall over in time. The low intensity burns would have reduced grass, shrub and small tree species. Areas affected by moderate severity burns may have some remnant understory and mixed tree species that survive. Most of the surviving trees would be of larger size with thicker bark. Eagles would be able to use the surviving trees in low or mixed burns for perching. The largest trees may be able to support a nest.

3.13.4.1.2 Black-backed Woodpecker

The Johnson Bar fire burned approximately 13,250 acres of forest habitat. The burn severity layer model for GIS shows about 11,803 acres in the low to high burn intensities. Moderately burned areas comprise 5,789 acres and severely burned areas were in 527 acres. Moderate burns would kill trees: scorching the bark and leaving brown tree needles, an indicator of a dead or dying tree. Not all trees are killed, but pockets of those that endured intense heat provide potential habitat for the black-backed woodpecker. Therefore, the recent fire would provide about 6,316 acres of potential habitat for this species.

Old growth stands are also considered as potential habitat for the woodpecker, due to the wood-boring insects that are attracted to dying trees and decaying wood in snags and downed woody material from wind or other elements. About 1,000 acres are in the Project Area.

3.13.4.1.3 Fisher

Prior to the fire, modelled potential fisher habitat in the project area was at 20,266 acres. The Johnson Bar fire burned over 6,300 acres at high or moderate intensities. These areas would no longer support the ≥40% canopy cover preferred by the fisher. Results of the fire have dropped potential fisher habitat to about 13,950 acres in the project area. Six old growth areas containing 1,017 acres of verified old growth lie in the analysis area. About 313 acres were burned in the fire: 139 acres affected by moderate to high severities, and probably do not retain the characteristics of old growth- due to loss of trees from mortality, consumed dead and decayed downed woody debris.

3.13.4.1.4 Flammulated Owl

The burn severity model was analyzed for potential flammulated owl habitat in GIS. Approximately 854 acres of potential flammulated owl habitat was detected in the project area. The mixed severity fire burned in about 632 acres, leaving 222 acres unaffected.

3.13.4.1.5 Bats: Fringed Myotis, Long-eared Myotis, and Long-legged Myotis

Modelled habitat was analyzed from GIS layers. The results show approximately 626 acres of suitable habitat available to fringed myotis is, and 3,143 acres of potential habitat for the long-eared and long-legged myotis. No records of these bat species in the project area have been confirmed, although 2 records exist of long-eared bats west of the project area.

3.13.4.1.6 Gray Wolf

A large portion of the Johnson Bar Fire Salvage Project is located in the Selway WMZ. Documented pack locations in the analysis area include the Selway Pack, which had 6 wolves detected in 2013 or 2014. The pack consists of a breeding pair and at least 2 pups

(IDFG and Nez Perce Tribe 2014). Other agency records indicate a wolf was detected in the project area during 1982 and 1984. It was not determined as to what pack this individual belonged to.

3.13.4.2 Management Indicator Species (MIS)

3.13.4.2.1 American Marten

Use of computer modelled habitat showed 19,253 acres of potential marten habitat in the project area. Database records show one marten detection in 2011.

The mixed severity fire reduced the canopy cover in most of the moderate and high intensity burn areas. Both of these areas are likely to be providing less than the canopy cover desired by the mammal. Additionally, food sources were killed or displaced during the fire which reduced the prey base after the fire.

3.13.4.2.2 Northern Goshawk

The forest GIS model shows 15,956 acres of potential goshawk nesting habitat is available in the Project area. Potential forage habitat was modelled at 20,468 pre-fire acres. Numerous detections of goshawks have been recorded across the Nez Perce National Forest. Available databases show 4 records of detected goshawk within the project area during the 1990s. The most recent observation occurred in summer of 2013 by a field crew.

The mixed severity fire would have displaced individual goshawks that may have been in the area during the event. Hatchlings of the year were most likely developed to the fledgling stage, and able to escape the flames from the event that began in August. Nesting habitat that was burned by moderate or severe intensities would have been consumed by fire. Canopy cover would be reduced below the level preferred for nesting habitat. Though some large trees or small patches may have survived the fire intensities, many would have lost limbs and tree needles from the fire effects. Potential prey in these areas would have been burned or fled from the fire. Most animals preferred in the goshawk diet would not be returning to the areas for a few years. So in the post-fire period of 1-3 years, goshawks would probably avoid these areas of compromised nesting habitat and minimal to no presence of an available prey base.

Areas of low intensity burns or that were unaffected by the fire may still provide nesting and foraging opportunities. Areas of ≥60% canopy cover and shrub understories would continue to function as goshawk habitat.

3.13.4.2.3 Pileated Woodpecker

The forest GIS model for pileated woodpecker habitat shows approximately 2,177 acres of nesting habitat and 20,433 pre-fire acres of foraging habitat located in the Project Area. The woodpecker is a common species on the Nez Perce National Forest.

Similar to the discussion on the northern goshawk, the mixed severity fire has reduced pileated habitats in some nesting areas. Areas of moderate to high severity burns would suffer a high tree mortality rate. Even large tree species would be harmed or killed by severe fire effects.

Mosaics of live trees may survive in these affected areas. They would usually be large to mature trees and species such as western larch, ponderosa pine and even some Douglas-fir.

Approximately 1,000 acres of verified old growth was calculated in the project area. About 140 acres of this was burned at moderate to high severity. The remaining 86% of old growth survived and offers potential nesting and foraging habitat for the pileated woodpecker. Large or mature trees ≥20-inch dbh in unaffected or areas of low intensity burns would likely continue to function as potential nesting habitat for the woodpecker.

The fire event has produced a large quantity of snags of various bole diameters. Those that are larger than 10-inch dbh would provide potential foraging habitat for the pileated woodpecker. Other species of woodpeckers would move in the season after the fire (2015) to begin feeding on the beetles and other insects that are attacking the dead trees. These birds include the black-backed woodpecker, three-toed woodpecker, northern flicker and downy and hairy woodpecker. The pileated woodpecker would forage on beetles (Bull and Jackson 1995). However, the bird's preference food is the carpenter ant. These and other ants would become more common in the break-down of decaying wood, from 3 to 10 years after the post-fire event. Snag densities and the availability of food sources would likely be very favorable for the pileated woodpecker during the next 15 years in the Project Area.

3.13.4.2.4 Rocky Mountain Elk

The analysis area falls in the Idaho Department of Fish and Game's Big Game Management Unit 16 of the Elk City Management Zone (EMZ). The most recent (2008) elk population survey in MU 16 showed that the total elk numbers are up from a previous survey in 2006. Cow elk numbers were higher in 2008 and met the State's population objective (see Table 3-48).

Table 3-48: Elk winter population status and objectives for MU10A based on the most recent survey (IDFG 2011)

Management Unit	Survey Year	Status				Population Objectives	
		Cows	Bulls	Calves	Total	Cows	Bulls
16	2008	4,264	863	875	6,002	3,150-4,650	675-1,000
16	2006	3,334	686	904	4,924		

State ratios of bull and calf to cows were analyzed (IDFG 2014). Bull to Cow ratios were 21/100 in 2006; while 2008's ratio was 20/100. The recruitment average of 27 calves/100 cows occurred during 2006. For 2008, the average declined to 21 calves per 100 cows. The calf/cow ratio is an important indicator of population recruitment and long-term herd viability. A ratio of at least 25 calves to 100 cows is needed to offset natural mortality. Reasons for the decline in ratios are unclear but may be related to reductions in forage quality (poor condition of cows and low calf weights), high predation rates, less security area, and greater human disturbance and/or hunting pressure.

Elk Winter Range: Winter range is primarily below 4,500 feet in elevation on southerly aspects and includes grasslands, brushfields, and timbered lands. Generally, winter range receives less snow and is located at lower elevations than summer range. During winter, cow elk seem to prefer shrub habitats, while bull elk favor more open timber types (Unsworth *et al*. 1998). Older bulls also tend to use higher elevation benches or ridges with heavier snowfall compared to habitat used by younger bulls and cows (Unsworth *et al*. 1998).

Quality forage is an important component of elk winter range. Elk forage on grasses, forbs, and the tips of twigs from some woody vegetation. Shrub fields and conifer forests provide a higher proportion of winter forage than grassland sites. Species such as redstem ceanothus, serviceberry, mountain maple, choke and bitter cherry, and syringa provide much of the winter forage available to elk.

The Nez Perce Forest Plan (1987) designates Management Area 16 as big game winter range, though other MAs provide elk habitat considerations as an ancillary management intent for consideration. MA 16 and MA 14 are the management areas that provide about 9,937 acres for elk winter range in the project area. The goal for MA 16 is "manage to increase usable forage for elk and deer on potential winter range." A portion of MA 14's intent is to improve the quality of winter range habitat for deer and elk. Other MAs would offer general elk habitat, such as riparian areas.

The elk winter and general range is spread out among 3 Elk Analysis Areas (EAA) in the Project Area. However, only 2 of these EAAs are affected by cattle allotments and road use changes. These two EAAs would be analyzed for project affects to elk. Both elk units are about 11 square miles in area. Roads open year-round either intersect or are adjacent to all blocks of winter range. Security around these areas of winter range appears low; however, the roads are not plowed during the winter months.

3.13.4.2.5 Shiras Moose

The Project Area encompasses about 810 acres of MA 21 winter range for moose. This area of winter range consists of 10 patches ranging in size from 8 to 387 acres. Half of the MA 21 patches are greater than 50 acres in size, while the other half is less than 40 acres in size. A total of 24 acres of MA 21 moose winter range was burned in the fire. No detections of moose in the project area were in the wildlife observation databases; however, moose and their tracks were observed in 2014 during and after the Johnson Bar fire

The fire event would have pushed individual moose out of burning areas and relocated these animals to unaffected areas.

3.13.4.2.6 Neotropical Migratory Birds

The Project Area contains portions of 6 OGAAs, with an approximate total of 2,771 acres of remaining old growth (after the fire event), and over 4,600 acres of riparian areas. Approximately one half of the Project Area was burned by the Johnson Bar Fire in 2014, including riparian areas, and 950 acres of old growth.

Fire intensities ranged from low to high with the respective tree mortality rates from 10-100%. Tree canopies were reduced, existing snags probably burned to the ground, and large portion of the existing downed woody debris was consumed.

The post-fire landscape would possess a large number of snags or dying trees that may still have pine needles on the branches. Areas that were affected by moderate to high fire severity would lack an understory, while the overstory would consist of larger diameter trees: many dead or dying, with some surviving the event. Low severity areas may retain most of the tree structure and patches of understory.

Generally, the canopy cover has been reduced throughout the burned areas. Hutto (1995) found 87 avian species in burned areas from 33 fires in Montana. Point counts were conducted in these areas during first or second year after the fire events. 77% were considered as migrants that winter to the south (Hutto 1995). The author does not elaborate if these birds are neotropical migrants, and most of these species have been seen in unburned forests as well. The species found in fire-affected areas represent most bird families with the exception of waterfowl and shorebirds. In general the mixed severity fire created a recovering forest with reduced canopy, large numbers of dead trees and more numerous open areas.

3.13.5 Direct and Indirect Effects

3.13.5.1 General Wildlife

The 2014 Johnson Bar fire burned with mixed severity in the affected area. Fire models and on the ground reports show a mortality rate for trees ranging between 10-100%. Areas that burned terrain at low fire intensity likely retained more vegetation and structure than areas of high intensity (such as stand replacing fires). Overall, the burned areas have altered the composition of wildlife communities.

Fires may create short-term increases in food that may contribute to population increases of some wildlife species (Smith 2000). The author mentions that potential increase of species depends on the animals' ability to succeed in the altered post-fire environment. When fire frequency increases or decreases substantially or fire severity changes from pre-settlement patterns, habitat for many animal species declines (Smith 2000).

Huff and Smith (in Smith 2000) noted one mixed-severity burn that showed less bird species turnover than the stand-replacement burn in the first 2 years post-fire. Some birds typical in unburned areas occurred in the mixed severity burn, but were absent from the stand-replacing burn. An increase in seed-eating bird species after crown fires is related to the available seeds from cones that have opened from response to the fire (Hutto 2006). Another study showed that after mixed-severity and stand-replacement burns in central Idaho, seed-eating birds were the most abundant songbirds (Saab and Dudley 1998). Raptor populations remained neutral or responded favorably to burned habitat as prey became more exposed to predation as their hiding cover was reduced (Lyon *et al*. 2000). As the vegetation recovers during the post fire period, raptors benefit from the increase in prey that forages on the regenerating vegetation.

Ream (1981) reviewed about 240 references on small mammals and fire. She concluded that populations of ground squirrels, pocket gophers, and deer mice generally increase after stand-replacing fire. Rabbits, snowshoe hare, red squirrel, northern flying squirrel, and voles generally avoid recent stand replacement burns (Ream 1981). Recent burns can increase food and nutrition for ungulates over the short-term (3-20 years). Lyon et al. (2000) noted that "ungulates are sensitive to alterations in vegetation structure, and their net response to fire depends on its severity and uniformity. Moose also rely on seral shrubs in many areas, especially where shrub-fields are interspersed with closed-canopy forest. Large carnivores and omnivores are opportunistic species with large home ranges. Their populations change little in response to fire, but they tend to thrive in areas where their preferred prey or forage is most plentiful—often, in recent burns."

Fire-caused changes in plant species composition and habitat structure influence reptile and amphibian populations (Means and Campbell 1981; Russell and others 1999). Amphibians in forested areas are closely tied to debris quantities—the litter and woody material that accumulate slowly in the decades and centuries after stand-replacing fire. (Lyon *et al*. 2000).

3.13.5.2 Effects Common to Analyzed Species

Old growth in the Project Area was calculated by adding MA 20 (designated old growth) and verified old growth (ground surveys that confirmed old growth) for a total of 2,884 acres. The Johnson Bar fire burned 950 acres of old growth at moderate to high severities, thereby compromising much of the characteristics that contribute to a stand's status as old growth. Therefore, an estimated 1,934 acres of old growth are present for consideration as habitat for certain species that utilize older or mature forests in the PA.

Timing of project activites is planned for year-round up to the end of 2018. Any concerns from wildlife and other resources that are addressed in the design criteria would be incorporated into the planning and implementation of the timber contract. Examples of such concerns would be soil conditions, fog, active bald eagle or northern goshawk nests, and so on.

Common effects from the action alternatives to the following analyzed species would be potential disturbance from project activities. This would include noise from machinery and other human activities. Those species dependent on current habitat may be displaced to other areas by the proposed activities. Other species may move to unharvested areas during daylight hours and return during hours of darkness. The latter species may continue to visit units between the time periods of different activities. Upon completion of the activities (roadwork, timber harvest, prescribed burning, tree planting) in the units, some wildlife species would return as soon as the following vegetation growing season. The time frame of return depends on the species and its preference for the various stages of vegetative succession that would occur over time.

All harvested units would be planted with native tree species found on the forest. The advantage of tree-planting is that trees and their root systems would become established and contributing to the nutrient cycle, adding stability to soils and reducing erosion or sediment loss. Under natural regeneration the above benefits are present, but it may take

5-20 years later for this to occur. During such a lag period, soil loss is imminent from erosion and loss of nutrients. Wildlife would not return to the affected areas until the vegetation component is there to provide habitat for them.

3.13.5.3 Region 1 Sensitive Species

3.13.5.3.1 Bald Eagle

The bald eagle is one of the largest raptors in the U.S. It is mostly found in habitats adjacent to large water bodies: rivers, lakes, and seashores. The eagle is an opportunistic predator which subsists mainly on fish, but it may hunt waterbirds (duck, herons, seabirds), small mammals and reptiles. It also scavenges dead animals, and has been detected on carcasses of deer and other small mammals during winter bald eagle surveys on the Central Zone of the Nez Perce- Clearwater National Forest.

Eagle populations had declined in the twentieth century to a point where the bird was listed on the endangered species list in 1978. After conservation and management efforts began to show an increase in populations, the eagle was determined as "recovered" and removed from the list in 2007 (USFWS Federal Register 2007). It is on the Region 1 sensitive species list (February 2011).

For nesting, the eagle selects a dominant or co-dominant tree that is in proximity to a large water body. The tree species is less important to the eagle pair than the tree's height, composition and location (Suring 2013). Roost trees (mature trees with strong limbs and well-developed canopies) are also used during winter as groups of eagles gather to forage, perch and provide security to one another (IDFG 2008).

The most sensitive time for disturbance of eagles, as is all birds, is during the nesting period. Therefore, management guidelines put restrictions on some human activities during the nesting period of January to mid-August. Additionally, recommended management zones range from 0.25 to 2.5 miles from the nest. The zones define the space and privacy for a nesting pair, and the size and shape of the radius around the nest is influenced by topography, vegetation and food sources (IDFG 2008).

Population Trends: Rangewide status of the bald eagle is apparently secure (G4/G5) and statewide status indicates it is vulnerable during breeding, and apparently secure during nonbreeding season (S3B/S4N) (CWCS 2011). The raptor is a sensitive species and MIS on the Nez Perce Forest. Currently, no bald eagle nests have been recorded along the boundary of the Project Area. Annual winter surveys since 1980 have shown presence of eagles along the boundary of the PA.

3.13.5.3.1.1 Alternative 1

No access management changes would occur. The mixed severity fire would offer potential nest or perch trees in areas of unburned or low burn intensities. In general, tree canopy cover has been reduced in the burned areas, which may reveal exposed prey or carcasses for eagle foraging opportunities.

Over time, potential nest trees that are dead or dying would lose the ability to support the large and heavy nests that eagles construct. Wintering eagles would continue to use the riparian habitat as perch trees, while foraging for fish or scavenging for dead animals.

3.13.5.3.1.2 Alternatives 2, 3, and 4

All action alternatives propose to salvage harvest in the project area. Large trees and/or snags would be left in all units as per the target stand prescriptions. No harvest would occur in the RHCAs buffering the rivers.

Ground based logging (tractor or skyline) would create noise or activities that may disturb eagles. Harvest in units would be at least 200 yards from the rivers' edge; leaving burned or unburned vegetation between the river and project activities. Foraging eagles may relocate their perch sites and hunting activities along other river stretches during activities in units that are visible to the bird(s). However, eagles appear to be somewhat tolerant of mechanical noise as traffic along Highway 12 has been occurring for decades. Any nests that are detected prior to or during activities would be accommodated by buffer distances and timing restrictions found in the project design criteria (see Chapter 2).

Helicopter logging would create impacts on eagle activities. Two studies detected that 36% to 11% of bald eagles were flushed from their nests when helicopter distances were between 490 - 2,190 yards away (Watson 1993). The author points out that disruption of nesting activities by aircraft may cause reduced breeding and feeding of the young, which may lead to diminished attentiveness and nest failure. The article primarily focused on helicopter presence/activity around eagle nests, but foraging eagles during the winter period may also be displaced by helicopter activities.

The potential eagle habitat in the project area that may be affected by proposed activities was calculated as all area within one half-mile from the rivers' edge/bank. This distance is considered as the primary use area of a bald eagle's nest. Alternative 2 would impact approximately 367 acres, Alternative 3 (290 acres) and Alternative 4 (226 acres). Both Alternatives 2 and 3 propose three helicopter landing sites adjacent to the rivers: 2 along the Middle Fork of the Clearwater and one along the Selway River. Alternative 4 does not propose any landing sites along the rivers.

The harvest salvage would not affect eagle habitat. The units are too far inland to offer perch sites along the rivers, and all live and large trees would be retained. Potential nesting trees remain abundant along the rivers and were largely unaffected by the wildfire.

Potential affects from the action alternatives would be noise and disturbance. Alternatives 2 and 3 would include helicopter activity encompassing noise, low flight altitudes above the tree canopy and repetitive trips across the rivers during daylight hours. No known nests have been detected in the area, so this activity would not be affecting eagle courtship, breeding or reproductive success of the species. If a nest is found, then design measures would be implemented and activities modified to space and time that would not disrupt nest success.

Foraging eagles would likely be displaced from perching areas that are in or near the flight zones of helicopter activity. This displacement would not be long-term; rather the effects would last for the period required to complete the harvest of the units associated with the helicopter landing site. Estimated time span of disturbance would be year-round, for up to 4 seasons. Bald eagles that are affected would shift their foraging up or downstream along the river sections that are not being disturbed by rotary-wing activity. Upon conclusion of the helicopter activity, eagles would resume occupancy of perches and foraging areas that were avoided during the periods of disturbance.

3.13.5.3.2 Black-backed Woodpecker

The black-backed woodpecker is a Nez Perce Forest sensitive species. The woodpecker's primary food source, woodborer beetles and their larvae, are most abundant within burned forests. In unburned forests, woodborers and bark beetles are found primarily in areas that have undergone natural disturbances, such as wind-throw, and within structurally diverse old-growth forests (Bull *et al*. 1986, Goggans *et al*. 1988, Hoffman 1997). Black-backed woodpeckers occur at highest densities in one to six-year-old burns that possess an abundance of snags for nesting and beetles, as well as wood-boring insects, for feeding (Hutto 1995, Saab *et al*. 2004). Burned forests are believed to act as source habitats from which birds emigrate once post-fire conditions become unsuitable (Nappi and Drapeau 2009) found high nest densities and reproductive success in a severely burned spruce forest. As the surviving tree tissue declines over time, the dependent beetles depart. Black-backed woodpecker nest success declines, and the bird moves on. Old forests may produce an insect food source that allows woodpecker populations to persist between fires in regions with long fire intervals (Hutto 2008) also found black-backed woodpecker presence was primarily influenced by the occurrence of high severity burn patches.

After stand-replacing fires, forests consist almost entirely of standing dead snags. Within weeks to months after the fire, these snags are colonized by wood-boring beetles which attract woodpeckers. Black-backed woodpeckers seem to depend on one- to six-year-old burns, and their numbers may peak in just two to three years after fires (Hejl and McFadzen 1999, Murphy and Lenhausen 1998). In a western Montana study of salvage-logged and unlogged recently burned forests, Hejl and McFadzen (1999) found that over 75% of the nests of black-backed woodpeckers were located in the unlogged portions of burned forests. In southwest Idaho, during the first five years after a fire in ponderosa pine/Douglas-fir forest, four pairs of black-backs consistently nested in a 1,200 acre unlogged area, and another four nesting pairs nested in a different 1,200 acre unlogged area (Dixon and Saab 2000). Goggans *et al*. (1988) recommend that in recently fire-disturbed areas, 30-50% of burned acres be retained, depending on the size of the fire, in large, contiguous and interconnected blocks, in order to provide sufficient habitat for black-backed woodpeckers.

Population Trends: According to NatureServe, the black-backed woodpecker is globally ranked as a G5 (globally secure), with state ranks of S3 (vulnerable) in Idaho (NatureServe 2006). In Region 1 of the Forest Service, the black-backer woodpecker is considered a sensitive species (2011). Regional conservation assessment estimates 716,185 acres (38%) of potential habitat on the Nez Perce Forest (Bush and Lundberg 2008). No records of black-backed woodpecker detection have occurred in the PA prior to the Johnson Bar fire.

3.13.5.3.2.1 Alternative 1

The recent fire has increased potential habitat for black-backed and other fire associated species. The increased pulse of insect activity that would forage on the decaying trees would be present from 1-6 years after the fire. Of the total burned area, about 7,020 acres (48%) of the affected areas would be preferred habitat for the woodpecker's forage and breeding activities. Alternative 1 is the no action alternative. No activities are planned and no new management actions would occur. Public road access in the area would not change, and fire suppression would continue.

3.13.5.3.2.2 Alternatives 2, 3, and 4

All of the action alternatives propose to harvest in potential black-backed woodpecker habitat. Alternative 2 would salvage harvest 1,534 acres, Alternative 3 (1,197 acres), and Alternative 4 (1,157 acres). The alternatives would comprise removal of the following percentages of potential black-backed habitat: Alternative 2 (22%), Alternative 3 (17%) and Alternative 4 (16%). No harvest would occur in verified old growth stands. All of the action alternatives would retain over the 50% retention of burned areas recommended by Goggans et al. (1988).

Project activities would produce disturbance to the woodpecker. Noise and activities from ground or aerial logging systems are likely to cause woodpeckers to avoid the affected harvest units during operational periods. Unit harvests would not be conducted simultaneously. Instead, units would be grouped into timber sales that focus on time intervals to be completed for each sale.

Some black-backed woodpeckers may nest and forage in proposed units that are undergoing harvest operations. Some nests may be lost, creating a direct effect of injury or mortality to the young in the nest. Foraging woodpeckers may be displaced to other areas unaffected by logging operations, and may even return to harvested units after operations have been completed. Silvicultural prescriptions would leave a quantity of leave trees (large dead and alive trees) that would offer foraging and maybe nesting opportunities.

3.13.5.3.3 Fisher

The fisher is a NPNF sensitive species and MIS, and an Idaho species of greatest conservation need (IDFG 2005). Fishers are closely associated with riparian habitats (Jones 1991; Ruggiero et al. 1994). Jones (1991) found that over 80% of his fisher relocations were within 100 meters of riparian habitats. Fisher favor areas with canopy cover over 40% and are dependent on mature and old forest in mesic (wet/moist), low elevation habitats (Ruggiero et al (1994). Cavities in large-diameter (>30 inches dbh), live or dead trees are the most commonly reported sites for natal dens, but hollow logs and rock substrates may also be used (Heinemeyer and Jones 1994, Aubry and Lewis 2003). Natal dens are typically situated 20 to 40 feet above the ground, and females may use multiple natal dens during the whelping period (Banci 1989, Heinemeyer and Jones 1994, Aubry and Raley 2002). Potential fisher habitat is abundant in the analysis areas in mesic upland, mature and old growth forest, and in riparian areas associated with old and late forest. Potential habitat is well connected by a dense network of RHCAs and closed canopy (>40%) forest.

Population Trends: Fishers have a state rank of S1 (critically imperiled). Fisher presence has been documented throughout much of the Nez Perce Forest, although the initial population information appeared to indicate a low level (Buskirk and Ruggiero 1994). Current fisher population numbers or trends were unknown in Idaho (IDGFG 2005) until some relatively recent research occurred. Historic records show a single detection of a fisher in the PA during 1994.

3.13.5.3.3.1 Alternative 1

No access management changes would occur. Along open roads, large snags would be removed by firewood cutters. Snags would remain available in the less accessible areas.

Areas within the fire perimeter that were unburned or of low burn intensity may still provide the percentage of canopy cover associated with the fisher. Burned areas would regenerate and grow to favorable conditions in 30-40 years. In the absence of future moderate to high severity fires or large outbreaks of insects/disease, habitat suitability would increase as the quantity of mature and old growth habitat increases. Connectivity would continue to be provided by riparian habitat conservation areas. Large burned or dying trees or snags would offer potential denning sites. Insects and disease would continue to cause tree mortality and produce snags and large down wood used by fishers for denning and resting.

3.13.5.3.3.2 Alternatives 2, 3, and 4

Forested areas that burned at moderate to high intensities were considered as not providing the canopy cover (≥ 40%) preferred by the fisher. The acreages in the proposed units of the action alternatives where such burn severities occurred were subtracted from each alternative. This consisted of a range of 1,150 to 1,500 acres. So Alternative 2 would harvest 1,439 acres of potential fisher habitat, Alternative 3 (1,383 acres) and Alternative 4 (1,141 acres).

Noise and other disturbances from machinery and human activities may affect a fisher, and cause the animal to relocate to areas where the mammal perceives safety from disturbance. Upon completion of the project activities, the treated units and other burned areas would regenerate and begin to offer favorable conditions for the fisher in 30-40 years. No harvest would occur in surviving old growth or any riparian areas. Thereby, contiguous corridors would be available along riparian areas for the fisher to move and forage.

3.13.5.3.4 Flammulated Owl

The flammulated owl is a small owl, considered a neotropical migrant, nests in tree cavities and preys on insects (Hayward and Verner 1994, Powers et al. 1996). The diet of this owl consists mostly of nocturnal moths and insects gleaned from open tree branches, taken on the wing, or picked up from the ground. Linkhart et al. (1998) observed in Colorado that 80% of intensive foraging areas were in old ponderosa pine and Douglas-fir mixed forest.

The owl forages in stands with low stem densities, moderately open canopies (35-65%), and very open understories. However, flammulated owls use dense foliage for roosting (Hayward and Verner 1994). Roost sites may be found in multi-layered, mixed-conifer forests with a ponderosa pine or Douglas-fir component and pockets of dense foliage. Flammulated owl habitats in Idaho are typically mid-elevation mature or older open ponderosa pine and/or Douglas fir forest (IDFG 2005).

Nesting territories are documented between 20-60 acres in size, but flammulated owls have been known to forage as much as 0.5 miles from their nest (Reynolds and Linkhart 1992). There is also some evidence to suggest that flammulated owls may form loose colonial groups or congregations for the purposes of breeding.

Population Trend: In Idaho, the flammulated owl has a state rank of S4 (apparently secure). There are no population trend data for Idaho. The owl is difficult to detect: it's nocturnal, has secretive behavior, and low population densities. In 2005 the Forest Service conducted an extensive survey effort for flammulated owls across Montana and Idaho (Cilimburg, 2006). This effort yielded a total of 243 widely distributed owl detections. Sixty-nine owls were detected/heard on the Nez Perce National Forest. None of these records were in the analysis area, but the US Fish and Wildlife database shows one owl detected in the PA in 2000, and FS Region 1 records show one owl detected about 1 mile outside the PA in 2010. No scientific evidence exists that the flammulated owl is decreasing in numbers in the Northern Region of the Forest Service (Samson 2006).

3.13.5.3.4.1 Alternative 1

No activities are proposed in this alternative. Areas unaffected by the fire would continue to offer habitat for the owl. Areas that burned at low intensity would most likely retain all large tree species that the owl uses for foraging and nesting. However, low severity burns may have destroyed or set back vegetation such as shrubs and small trees. Those understories may have temporarily (1-5 years) lost the ability to produce flowers or nectar sources important to lepidopterans or other plant structures that provide forage for other insects that the flammulated owl feeds on. Not all foraging areas were burned. Pockets of untouched shrubs or herbs would still be present and providing food and cover for insects. As beetles and other insects move in to feed on the burnt or decaying matter, this may provide a pulse of food opportunities for the owl.

More severely burned areas would have lost some of the larger ponderosa pine or Douglas-fir species that the owl depends on for nesting or perching. About 5 years post-fire, the understory in all burned areas (except those of high intensity burns) would provide some foraging habitat for the owl. In the areas that suffered high intensity burns, the recovery of shrubs and understory would take longer than 5 years post-fire to offer some forage. The return of nesting habitat may take up to 100 years for trees to develop the structure preferred for owl nesting potential.

3.13.5.3.4.2 Alternatives 2, 3, and 4

All action alternatives would harvest in portions of potential flammulated owl habitat that was burned by the fire. All three action alternatives would harvest 60 acres in unburnt to low intensity areas. Areas that burned at a low severity would begin to recover vegetation in 1-5 years post-fire/harvest. As the vegetation continues to recover, potential prey would increase for the owl.

Noise and project activities may cause an owl to relocate to an area outside the affected units that it perceives as safe. All project activities would occur during daylight hours, so the nightly foraging by the owl may take it back into or along the edges of harvest units.

Tree-planting is planned to occur in all units after they have been harvested. Some ponderosa pine would be included in units that are along ridges or aspects that receive a moderate amount of sunshine. In about 80 years, these trees would be the future nesting platforms for flammulated owls.

3.13.5.3.5 Bats: Fringed Myotis, Long-eared Myotis, and Long-legged Myotis

Three bat species associated with forest habitats in the analysis area are listed as sensitive species. In wildland settings, these three bats typically roost in snags, rock crevices, and caves. The fringed myotis is a species of greatest conservation need in Idaho (IDFG 2005). The long-legged myotis is more closely associated with coniferous forest habitat than either the long-eared myotis (second in association) or the fringed myotis. All three species are known to be multiple habitat bats in regard to roosts, hibernacula, and foraging habitats. Long-legged and long-eared myotis are known to forage together. Long-legged myotis and long-eared myotis are associated with old growth forest conditions in the Northern Region (Warren 1990).

All three bat species are known to utilize caves, mines, buildings, cliff faces, bridges, exfoliating tree bark, snags, and crevices in rocks as roost and hibernacula sites. There are no caves, mines, or old buildings in the analysis area that would be suitable hibernacula sites. Large trees with protective bark and large snags are the primary roosting habitat components available in the analysis area.

Habitat information suggests that the fringed myotis is more closely associated with forest conditions found on drier breaklands than mesic uplands. This bat is often found in dry habitats where open areas are interspersed with mature forest, creating a complex mosaic with ample edges and abundant snags (Keinath *et al*. 2004).

Long-eared myotis are habitat generalists in their selection of roost structures among various landscape conditions (Arnett and Hayes 2007). Long-eared myotis roost under exfoliating tree bark, and in hollow trees, caves, mines, cliff crevices, sinkholes, and rocky outcrops on the ground. They also sometimes roost in buildings and under bridges (Western Bat Working Group 2005). Landscape snag densities influence the use of different types of roosts. Arnett (2007 and Hayes) found the frequency of snag use by long-eared myotis increased with density of snags and was nearly twice as high in landscapes with high snag densities (>2.2 snags/ac) as in those with low snag densities (<1 snag/acre).

Long-legged myotis are medium-sized bats, prefer large snags for roosting, but would also roost in live trees. Arnett and Hayes (2007) found that long-legged myotis infrequently roosted in snags or trees in stands <40 years old, and 58% of the snag roosts and 33% of the live tree roosts were located within riparian management buffers retained during harvest near small- and medium-sized perennial streams. Long-legged myotis roosted in snags in mid-seral (41-80 years) and old growth stands.

Arnett and Hayes (2007) indicated that the odds of snags and trees being used as roosts by female bats increased with increasing diameter. Large trees in the study tended to be in more open areas or extend above the canopy, thereby increasing detection and access for bats, as well as increasing exposure to solar radiation which contributes to cavity warming and more desirable roost microclimate. Also, the thermal and insulated qualities of wood and bark increase with diameter, resulting in more stable roost temperatures. Increased warmth of roosts reduces energetic demands and facilitates development and growth of fetuses and juveniles. Bats also may use large snags and trees because they are of sufficient age and size to have developed numerous cavities and more exfoliating bark area suitable for roosting.

All three bats have been detected on the Nez Perce portion of the forest and the north zone of the Clearwater forest. Records show 2 detections of long-eared myotis: one about 1 mile, another about 2 miles from the project boundary. Both detections were west of the project area.

Population Trends: Long-legged and Long-eared myotis have a global rank of G5 (secure) and an Idaho State rank of S3 (vulnerable). The fringed myotis has a global rank of G4/G5 (apparently secure/widespread, abundant, and secure) and an Idaho State rank of S2 (imperiled). The Western Bat Working Group (1998) ranked long-eared myotis and long-legged myotis as moderate conservation concerns. The present population status of fringed myotis is unknown. The Western Bat Working Group (1998) concluded that this bat may be uncommon or rare through the bulk of its western range, not merely at the periphery. The bat was one of the least common detected species during surveys in north Idaho (Romin and Bosworth 2010). This information is consistent with the pattern of limited and patchy distribution that was the basis for including the fringed myotis on Idaho's list of species of greatest conservation need (IDFG 2005).

3.13.5.3.5.1 Alternative 1

No actions would be planned or occur with this alternative. Bat habitat would likely remain stable in areas unaffected by the fire or areas of low burn severity. Snags located near roads would likely be affected by wood cutting for firewood. However, snags further from roads or in dense forest would continue to function as habitat for bats.

The fire produced a large pulse of snags in the PA. Therefore, it appears that an abundance of potential nesting and resting habitat is available for bats. Wind events would decrease the number of standing snags and may cause injury or death to a bat that accompanies a snag falling to the ground.

The prey base for bats would increase during the post-fire season, as many winged invertebrates would arrive to feed on the dead and dying wood. As vegetation recovers, shrubs and other plants would offer nectar sources for lepidopterans and other insects that bats feed on.

Fire suppression is likely to occur in the future. This response would reduce snags in or near burned areas, but may also save or retain patches of large trees. Smaller openings created by fire of wind could be beneficial, as these patches would provide forage for insects during early succession.

3.13.5.3.5.2 Alternatives 2, 3, and 4

Action alternative effects to potential habitat for the fringed myotis would harvest 70 acres in Alternatives 2, Alternative 3 (40 acres) and in Alternative 4 (47 acres). For the long-eared and long-legged myotis, Alternative 2 would harvest 209 acres, Alternative 3 (175 acres) and Alternative 4 (183 acres). Stand prescriptions would retain all live trees and some large dead or dying trees. Units proposed for helicopter logging would retain fewer snags than other units, due to safety concerns of rotor wash knocking down snags. In the proposed units using ground based logging systems, most of the larger dead or dying trees would be retained in patches. Arnett and Hayes (2007) state, "Maintenance and recruitment of snags represents the cornerstone for conservation and management of bats in forests . . .[retain] large (>50.8 cm DBH [20 inches DBH]) snags that either protrude above the canopy, reside near a gap or stand edge, . . . Large, solitary snags can provide roosts for species, but retaining patches of snags would likely increase the probability of use of snags and trees as roosts. Retain snags in upslope habitats and across a range of slope exposures to provide roosts with varied microclimates offering choices to optimize thermal benefits depending on ambient conditions". The stand prescriptions would be providing some habitat and recruitment snags for bats.

According to Vonhof and Barclay (1997), forest management creates openings and edges for foraging. Forest practices that may provide suitable foraging habitat and enhance roosts include vegetation management with reserve trees and snag retention, and prescribed fire to enhance herbaceous growth for insect production and to create roost sites. Waldien et al. (2000) stated that management of roosts for forest-dwelling bats should focus on maintaining large conifer snags across the landscape through space and time. The action alternatives would meet the latter suggestion.

Construction of temporary roads in all action alternatives would impact less than 30 acres. All trees would be removed for the placement of the roads. Upon conclusion of the project activities, these temporary roads would be decommissioned and planted with trees or other vegetation.

Noise and project activities would create disturbance. Disturbance to roosting bats may cause them to arouse and expend high amounts of energy which can lead to roost abandonment or death in the winter (Adams 2004). Harvesting would reduce the quality and quantity of available roost sites, but retaining large trees and snags would provide habitat once favorable conditions develop in treated areas (Chapter 2, Design Measures). Clumps of green trees and snags may provide suitable habitat in treated areas, especially those near the edge of units.

3.13.5.3.6 Gray Wolf

Gray wolf populations were extirpated from the western U.S. around the 1930s. Over time, individual wolves from Canada occasionally dispersed into Idaho. The gray wolf was listed as an endangered species in 1978. In the mid-1990s, gray wolves were introduced into central Idaho. By 2011 the USFWS finalized the delisting of the wolf in Idaho (IDFG and Nez Perce Tribe 2014).

The gray wolf is a Nez Perce National Forest sensitive species. Wolf habitat spans a broad range of elevations and habitat types. Key habitat components include: 1) a sufficient year-round prey base of ungulates and alternate prey; 2) suitable somewhat secluded denning and rendezvous sites; and 3) sufficient space with minimal exposure to humans (USDI 1987).

Denning/rendezvous sites, elk habitat effectiveness, and elk security areas (see Elk section) are used to assess existing conditions for wolves. Maintaining elk habitat effectiveness above minimum Forest Plan standards, providing elk security areas above minimum recommendations, and managing winter range to enhance forage productivity and quality would provide a sufficient prey base to sustain wolf populations at State objectives for the Selway Wolf Management Zone (WMZ).

Population Trends: The Idaho wolf population has increased from reintroductions in the 1990s through 2009 (the first year of the state's wolf hunting season). Since then, the numbers of individuals and packs have declined. The IDFG and Nez Perce tribe monitor wolves through a cooperative agreement signed in 2005. By the end of 2013, biologists documented 107 packs and 659 estimated wolves (IDFG and Nez Perce Tribe 2014). Twenty of the packs qualified as breeding pairs, producing a minimum of 166 pups (IDFG and Nez Perce Tribe 2014).

3.13.5.3.6.1 Alternative 1

None of the proposed management activities would occur under this alternative. There would be no direct or indirect effects to denning or rendezvous sites. Elk habitat effectiveness in all affected elk analysis areas (EAA) would remain above the 25% threshold established in the Forest Plan. Habitat security would range from 17 to 21% in the affected EAAs. Road densities would remain low and as forage increases during the Project Area's recovery from fire effects, habitat security would increase. Though elk and other prey are present in the analysis area, wolves may prefer to hunt in other areas until the new or surviving forage increases in quantity and quality to attract elk and other big game back to the burned areas. One wolf pack was recognized in the area, but an increase in elk and big-game response to the increase in forage (about 10 years after the fire and harvest) may attract other adjacent wolf packs to the burned area. Future fires or outbreaks of insects and disease would help maintain prey in the area for the wolf. The latter disturbances reduce hiding cover for wolves and their prey, but would increase forage over a period of 20 years. Wolf management would continue until the state is meeting desired numbers of elk.

3.13.5.3.6.2 Alternatives 2, 3, and 4

All salvage harvest would occur in areas burned by the Johnson Bar Fire. No harvest would occur in old growth or riparian areas. All live trees would be retained, along with large dead and/or dying trees that would not pose a safety hazard to personnel involved in the proposed activities. Alternative 2 would harvest 2,973 acres, Alternative 3 would harvest 2,580 acres and Alternative 4 would harvest 2,298 acres in the project area. The alternatives would affect between 8-11% of the Project Area and between 17-22% of the burned areas.

Tree harvest and prescribed burning of slash piles would create openings that offer sunlight and nutrients to new vegetation. In 3-10 years after the salvage harvest, forage for elk would increase. The amount of forage from timber harvest would increase most in Alternative 2, and least in Alternative 4. Forage would improve as shrubs, grass and herbs grow and expand over bare soil. This would last for a period after prescribed burning to about 20 years.

In the short term (up to 20 years), hiding cover in regeneration and improvement harvest areas would decrease in each alternative. The proposed harvest in all action alternatives would create more open forest stands, but some hiding cover would be retained. As vegetation recovers from planted trees and natural regeneration, cover would increase and become more distributed in the analysis area. Elk habitat effectiveness is expected to increase under all action alternatives and remain above minimum Forest Plan objectives. (see Elk section).

Similar to other species, the project would create noise and disturbance to wolves in or near affected areas. All of these activities would be conducted during daylight hours. No wolf dens or rendezvous sites have been identified.

Since depredation measures on wolves has been occurring for the past few years, the animal may be more wary of human contact, and would avoid areas of human presence. However, in the absence of humans, wolves may hunt harvest units during the hours of darkness, as potential prey (deer, elk and so on) may be present. Timber harvests have been recognized by industry and field personnel to sometimes attract elk or deer to harvest units for the purpose of foraging on the leaves, needles or lichens from the fallen trees.

Road construction and prescribed fire are other human activities that may disturb wolves. All temporary roads used for timber operations would remain closed to public motorized access. In time the absence of human activity may attract wolves back to these areas to hunt or travel through.

3.13.5.4 Management Indicator Species (MIS)

3.13.5.4.1 American Marten

The American marten was identified as a Nez Perce National Forest management indicator species for mid to high elevation, mature forest. The marten has a close association with late succession, mesic-dominated forests, especially those with uneven age structure and gaps in the canopy (Buskirk and Ruggiero1994). Marten need dense overstory (>30%) and sufficient understory cover for hiding and denning (Snyder and Bissonette 1987). However, it is possible that marten may be more associated with complex vertical and horizontal woody structure, as opposed to forests of a particular age, species, or overstory requirement (Chapin et al. 1997). American marten are found at higher elevations and on mid-slopes during winter; in summer, martens use riparian areas more intensively (Buskirk and Ruggiero1994). Marten use habitats similar to those used by fishers, but unlike fishers, they can hunt efficiently both in the subnivean layer (under snow) and on the surface of deep snowpacks (Aubry and Lewis 2003). Non-forest associations are used upon occasion during summer, and martens may hunt in open meadows bordering dense forests if hiding cover is present (Hargis et al. 1999, Buskirk and Powell 1994).

Resting and denning sites are important habitat components, as they provide marten protection from predators, inclement weather, and thermal stress (Bull and Heater 2000). In the central Rocky Mountains, large logs (>16 inches diameter), large snags (>16 inches dbh), and live spruce and fir trees >8 inches dbh were important characteristics for marten den sites, and rock crevices and red squirrel middens were used along with logs and snags (Ruggiero et al. 1998). Pine marten prey on voles, snowshoe hares, red squirrels, ground squirrels, berries, birds, and eggs (Ruggiero et al. 1998).

Population Trends: Considered as G5 (secure) global status, and S5 (secure) status in Idaho (NatureServe 2014). Total population size is unknown but probably is at least several hundred thousand (NatureServe 2014). Samson (2006) indicates 17,297 acres of suitable habitat is needed to maintain a viable population of marten in Region 1. Bush and Lundberg (2008) show over one million suitable habitat acres are on the forest. American marten are managed as furbearers that can be legally trapped in Idaho.

3.13.5.4.1.1 Alternative 1

No activities are proposed with this alternative. Unburnt and low intensity burned areas would likely have retained a large percentage of the canopy cover and prey base that was present prior to the fire. These areas, including riparian corridors of unaffected or low intensity burns, would continue to offer habitat for the American marten. More severely burned areas would take 40 or more years to recover the structure associated with marten use. Fire creates and maintains openings where abundant fruits, insects, ground squirrels, and voles provide food items for the marten during the summer (Koehler and Hornocker 1977).

Fire suppression of wildfires may save some areas of marten habitat. Post-fire recovery of vegetation would offer increasing habitat for small mammals and birds the marten preys on.

3.13.5.4.1.2 Alternatives 2, 3, and 4

Alternative 2 would impact about 2,557 acres of marten habitat. Of this, 1,313 acres were burned at moderate to high severity, 1,061 acres were burned at low severity, and 183 acres were unaffected by the fire.

Alternative 3 would impact about 2,239 acres of marten habitat. Of this, 1,039 acres were burned at moderate to high severity, 1,016 acres were burned at low severity, and 184 acres were unaffected by the fire.

Alternative 4 would impact about 1,938 acres of marten habitat. Of this, 985 acres were burned at moderate to high severity, 769 acres were burned at low severity, and 184 acres were unaffected by the fire.

Salvage harvest in areas burned by moderate to high intensities would not affect marten, as the animal has already been displaced from the affected areas due to the wildfire and resulting loss of preferred habitat. The Johnson Bar Fire burned approximately 1,313 acres of potential marten habitat at such intensity as to remove these areas from the status of functional habitat for the mammal. This leaves about 17,940 acres that exist as marten habitat. The latter habitat consists of areas unaffected by the fire or those areas that endured low severity burns. The action alternatives would impact about 1,244 acres (7%) by Alternative 2, Alternative 3 would impact about 1,200 acres (7%) and Alternative 4 would impact 953 acres (5%).

Portions of harvest units in lightly burned areas would retain all live trees, and large snags that would not be a safety concern for logging operations. Due to safety issues, fewer snags would be retained in helicopter-logged areas versus tractor-logged areas.

Direct effects from proposed logging and road building operations would be noise and disturbance activities that may displace marten from the affected areas. Indirect effects may be displacement of the marten's prey base in the affected areas. The predator would shift its hunting locations to where the prey base can be discovered.

3.13.5.4.2 Northern Goshawk

The northern goshawk was identified as a National Forest management indicator species for old growth forest. Current condition of nesting habitat is analyzed, as it is the most limiting factor for goshawks. Nesting habitat is represented by a much narrower range of vegetation structure and composition than the post-fledgling areas and forage area.

Goshawks use large landscapes, integrating a diversity of vegetation types over several spatial scales to meet their life-cycle needs (Squires and Kennedy 2006). In "The Northern Goshawk Status Review," the USFWS found that the goshawk typically uses mature forest or larger trees for nesting habitat; however, it is considered a forest habitat generalist at larger spatial scales (USFWS 1998). The FWS found no evidence that the goshawk is dependent on large, unbroken tracts of "old growth" or mature forest (63 FR 35183 June 29, 1998).

Nest areas are usually mature forest with large trees, relatively closed canopies (60-90%) and open understories (Squires and Kennedy 2006). Goshawks have been found to use the same nesting area for decades, and goshawk territories typically contain a number of alternate nests (Patla 1997). Goshawks appear to range over large areas and use a variety of habitats outside of the nesting area. Home ranges vary from 1,200 to 9,800 acres in size (Kennedy 2003).

Goshawks prey on a variety of medium-sized forest birds and small mammals (e.g. snowshoe hare, squirrels, grouse, other forest birds) in early seral to mature forests and forest openings. Foraging habitat may be as closely tied to prey availability as to particular habitat composition or structure (Beier and Drennan 1997). The raptor may also hunt along forest edges and in small openings. Large diameter snags and stumps are often used as plucking posts where goshawks consume their prey.

Population Trends: The goshawk is rated secure across its range (global rank G5) and is not listed as a state species of greatest concern. Other studies show no evidence that the northern goshawk is declining in number in the western United States (Kennedy 1997, FR(63) 124 1998, Kennedy 2003, Andersen et al 2005, Squires and Kennedy 2006). Samson (2005) concluded no scientific evidence exists that the northern goshawk is decreasing in number in the Forest Service Northern Region. Samson (2006) concluded that to maintain a minimum viable population of the northern goshawk across Region One, there would need to be a minimum of 30,147 acres of post-fledging habitat. Bush and Lundgren (2008) show over 275,000 acres of post-fledgling habitat on the Nez Perce Forest, many times the area needed to maintain viable populations region-wide.

3.13.5.4.2.1 Alternative 1

None of the proposed activities would occur under this alternative. The mixed severity fire burned over the areas where goshawks were detected during the 1990s. However unburned areas exist in the PA, and may be used by the raptor for nesting or foraging.

Future fire suppression in the area would limit the amount and size of burned areas created by wildfires. This would benefit nesting habitat, and create more forage habitat.

3.13.5.4.2.2 Alternatives 2, 3, and 4

Harvest units are located in burned areas of mixed intensities. Forested areas consumed by moderate to high intensities are not considered as current habitat supporting goshawks. Potential remaining or functioning nest habitat that is proposed to be harvested is about 1,119 acres in Alternative 2, Alternative 3 (1,079 acres) and Alternative 4 (853 acres).

Potential remnant or functioning forage habitat that is proposed to be harvested is about 1,345acres in Alternative 2, Alternative 3 (1,300 acres) and Alternative 4 (1,053 acres).

If an active goshawk nest is detected, project design criteria (Chapter 2) would be implemented.

All of the action alternatives would be retain all live trees and large snags that would not pose a safety issue. As mentioned in other sections of this report, helicopter salvaged units would retain fewer snags in than those of ground-based harvest systems. These remaining trees would offer potential perch sites for the raptor, and some foraging habitat for forest birds.

No harvest would occur in verified old growth or areas of mature trees unaffected by the fire. All riparian areas in the analysis area would be unaffected by timber activities. All salvaged units would be re-planted with tree species native to the forest. Upon completion of project activities, natural forest succession would create forage habitat for the raptor in about 10 years, and nesting habitat in 100-150 years.

During project implementation, human activity, equipment noise and burning would be disturbances that goshawks avoid. Completion of the project and human absence may encourage the raptor to hunt the new openings for prey.

3.13.5.4.3 Pileated Woodpecker

The pileated woodpecker is a Forest management indicator species for old growth forest and large snag habitat. Similar to the northern goshawk, the current condition of nesting habitat is considered the most limiting factor for pileated woodpeckers. The woodpecker's nesting habitat is a more specialized range of vegetation structure and composition than the stand age and structure for foraging habitat. The nest tree is the most important variable to estimate breeding habitat use by the pileated woodpecker (Kirk and Naylor 1996, Giese and Cuthbert 2003).

Pileated woodpeckers are large, cavity-nesting birds associated with late successional stage forests, but also may use younger forests that have scattered, large, dead trees (Bull and Jackson 1995). The woodpecker appears to seek out microhabitats with a higher diversity of tree species and densities of decadent trees and snags than are available across a landscape (Savignac et al. 2000, Aubry and Raley 2002b). Through their selection of large dead and damaged trees, the bird may serve as a good indicator of ecological function rather than just the age of a stand or forest (Bonar 2001).

Nest trees are typically dead, and nest cavities possess a good insulative value. Most nest trees in northeast Oregon were in ponderosa pine, but larch and grand fir were also used (Bull and Jackson 1995). The mean dbh of nest trees was 33 inches, trees averaged about 90 feet high, and the mean height of the nest cavity was about 50 feet. In Montana, pileateds nested in a variety of tree species, including larch, ponderosa pine, grand fir, and Douglas-fir (McClelland and McClelland 1999). Nest trees averaged 28 inches dbh and 95 feet high, and stands typically had >50% canopy closure (Aney and McClelland 1985).

Pileated woodpeckers roost in hollow trees or vacated nest cavities at night and during inclement weather. Roost trees are similar to nest trees but typically have more entrances. In northeast Oregon, pileateds roosted in unlogged stands of old growth grand fir with canopies >60%. Roost cavities were in live or dead grand fir, larch, or ponderosa pine trees, and 95% had a hollow interior created by decay rather than excavation (Bull and Jackson 1995). Bull and Jackson (1995) suggest that by excavating only the entrance hole to gain access to the hollow interior of a tree, pileateds conserve energy by not having to excavate the entire cavity. In Montana, pileateds roost in western larch, black cottonwood, and ponderosa pine (McClelland and McClelland 1999).

Feeding habitat for pileateds is highly dependent on the availability of carpenter ants which make up the majority of their food supply (Aney and McClelland 1985). Cover types selected by the woodpecker include mixed conifer, ponderosa pine/Douglas-fir, western larch, grand fir, and decadent lodgepole pine stands. Preferred feeding habitats have high densities of snags and logs, dense canopies, and tall ground cover, with more than 10% of the ground area covered by logs. Pileateds seem to forage on large, decayed trees, and preferentially forage at low heights on tree boles; down material may need to be in excess of eight inches diameter and stumps between four to six feet high before pileateds would use these structures for foraging (Aney and McClelland 1985, Flemming et al. 1999).

Territories of nesting pairs cover 500-1000 acres in Montana, 1000-1300 acres in western Oregon, and 320-600 acres in northeastern Oregon (Aney and McClelland 1985). Not every stand within a bird's home range is used as feeding habitat. The range of a nesting pair is partly determined by the amount of suitable feeding habitat in proximity to the nest site.

Pileated woodpecker cavities are an important resource for a variety of cavity-using wildlife, especially those animals or birds that are too large to utilize cavities created by smaller woodpeckers (McClelland and McClelland 1999, Bonar 2001). In addition, pileateds provide foraging opportunities for other species and accelerate decay processes and nutrient cycling (Aubry and Raley 2002b).

Bull and Meslow (1977) concluded that to maintain a pileated woodpecker population in northeast Oregon, 0.14 snags per acre 20 inches dbh or greater were needed. Bull and Holthausen (1993) later recommend maintaining a minimum of 0.65 snags per acre greater than 20 inches dbh. Retention of large, seral tree species is an important component for maintaining habitat for this species in managed forests.

Population Trends: The pileated woodpecker is rated secure across its range (global rank G5) and apparently secure (state rank S4) in the state of Idaho (ICWCS 2015). Samson (2006) concluded that no scientific evidence exists that the pileated woodpecker is decreasing in numbers in the Northern Region. He indicates 90,441 acres are required to maintain a viable pileated woodpecker population in the Forest Service Northern Region. Bush and Lundberg (2008) show 299,667 acres of nesting habitat and 444,789 acres of foraging habitat on Nez Perce National Forest. Based on Bush and Lundberg's (2008) estimate, the Nez Perce Forest contains about three times more nesting habitat than is needed to provide viability at the Regional level.

3.13.5.4.3.1 Alternative 1

This alternative would not create any direct or indirect affects, as no activities are proposed. The mixed severity fire has produced a supply of snags and insects that pileated woodpeckers would forage on for 10-15 years after the fire event. Snags of large diameter (≥20" dbh) would offer potential nesting habitat. Fire suppression would continue. Fuels in the Analysis Area would continue increasing, making the area susceptible to a stand-replacing fire event in 10 to 20 years. Such an event would burn some snags to the ground. However, wildfire would also create snag habitat for pileated woodpeckers. Overall, suitable habitat would remain available across the area as forest succession continues.

Firewood cutting would reduce snags along roads open to public motorized access. However, the majority of the analysis area is beyond such access, and snags would continue to be a represented across the area.

3.13.5.4.3.2 Alternatives 2, 3, and 4

All action alternatives would propose harvest units in mixed severity areas. Nesting habitat is considered to have some loss of large snags in moderate to high intensity areas. Harvest in such areas would affect 103 acres in Alternative 2, Alternative 3 would impact (93 acres) and Alternative 4 (52 acres). In these alternatives, another 50-100 acres would be harvested in low burn areas. Silvicultural prescriptions would retain all live trees, and large snags that would not create a safety concern for the logging system that is used.

Foraging habitat would be reduced by 2,771 acres in Alternative 2, Alternative 3 (2,409 acres) and Alternative 4 (2,119 acres). The same prescriptions would apply as those mentioned in the previous paragraph. New temporary road systems would remove up to another 35 acres of trees to construct the prisms.

Most of the retained snags or dying trees would possess diameters (≥15” DBH) and saved in patches if possible, or as solitary trees/snags. Though canopy cover would be less than the (>60%) habitat used by pileated woodpeckers for nesting, foraging habitat would be available from the amount of woody debris left after the harvest.

Prescribed burning would occur in units, which would target small sized fuels and large piles of slash. Vegetation treatments in all action alternatives would reduce habitat quality by decreasing canopy cover, and reducing standing snags in treated areas according to the safety practices associated with the logging system designated for each unit.

No harvest would occur in areas of verified old growth, live mature trees or riparian areas. All salvaged units would be re-planted with tree species native to the forest. Upon completion of project activities, natural forest succession would create nesting habitat for the woodpecker in about 100-150 years.

Action alternatives would cause short-term displacement of individual pileated woodpeckers in treated areas. During project implementation, human activity, equipment noise and prescribed burning would preclude or discourage use in and near treated areas. Completion of the project and human absence would encourage the woodpecker to return to burned areas for food and nesting opportunities. Disturbance of individuals during project implementation is unlikely to cause measurable injury or decrease productivity, by substantially interfering with normal breeding, feeding, or nesting behavior on a forest-wide basis.

3.13.5.4.4 Rocky Mountain Elk

Elk is a MIS for commonly hunted big game species on the Nez Perce National Forest, and an indicator for general forest seral species easily affected by management activities. Elk are habitat generalists and use a diversity of forest types and structures that provide forage and hiding cover. They use meadows and early seral communities for foraging in spring through early summer. From late summer through fall, elk forage more frequently under the forest canopy. During winter, they rely upon low elevation, warm aspect, and snow free or snow limited areas for foraging. Adult bulls often winter at much higher elevations than cows and immature elk. Elk also require forest cover for security and thermal regulation (Thomas et al. 1979). Calving areas can be traditional and preferred sites are generally large meadows, shrub fields and early seral forest openings in close proximity to water. A mosaic of diverse forest, shrub field, and meadow conditions with available water, productive winter range, and adequate security characterizes good elk habitat.

Population Trends: Elk populations in the analysis area were relatively insignificant until major fire events occurred in the early 1900s that increased forage availability and population levels. Populations in the north and central areas of Idaho probably peaked in the 1960s (IDFG 2014). Since the 1990s, elk populations in north and central Idaho have declined in forested areas due to weather events, predation by bears and lions, and more recently from wolf expansion. Active predator management is currently pursued by IDFG, and the statewide population as of 2013 is estimated at approximately 107,000 animals.

3.13.5.4.4.1 Alternative 1

There would be no direct effects to elk winter range under this alternative, as no project activities would occur. The approximate winter range acreage represents about 37% of the PA. About two thirds of the MA 16 winter range was burned by the Johnson Bar Fire. Areas of moderate to high burn severity would not begin providing browse until about 5-10 years post-fire. Areas of lower burn intensities would generate browse in 1-3 years post-fire. Canopy cover was generally reduced from the fire effects. Again, the more severely burned areas have lost a great deal of forest structure, and now consist of snags and open areas.

Elk would be expected to begin using the lesser affected areas in the fire perimeter within 2 years post-fire. For the next twenty years, forage habitat would improve in quantity and quality for elk. As the tree canopy recovers, the same forage would decline as it is shaded out. Insects and disease would continue to create canopy gaps and provide for a small supply of shrubs, forbs, and grasses.

Fire suppression would continue to be implemented against wildfires. This may reduce the potential forage habitat a wildfire could create, yet suppression would retain more hiding cover and thermal cover for elk.

Livestock grazing would continue, which could promote invasive weed establishment on the breakland areas, potentially decreasing forage quality. Because of the difficulty in controlling and/or eliminating noxious weeds, this would have a long-term effect. As trees regenerate, forage quantity would again decline as hiding cover is restored.

Current roads open to the public would remain. During winter these roads are not maintained and snow accumulations would close or restrict access to certain sections of the road network to most wheeled vehicles.

3.13.5.4.4.2 Alternatives 2, 3, and 4

Of 9,930 acres of MA 16 winter range, Alternative 2 would harvest 1,615 acres, Alternative 3 (1,134 acres) and Alternative 4 (1,022 acres). All of the proposed acres to be harvested are also in areas burned by the fire. The alternatives would also harvest in other MAs that could function as general elk forage habitats: Alternative 2 would salvage harvest in 1,358 acres, Alternative 3 (1,446 ac.) and Alternative 4 (1,276 ac.).

As mentioned throughout this section, regen harvest prescriptions would retain all live trees. Large dead or dying snags in patches or solitary status would be retained in areas where they would not be safety concerns to timber activities in the affected units. The result would be rather open areas, with patches of trees that would offer some hiding cover. No harvest would occur in old growth or riparian areas.

The action alternatives would create disturbance (noise and human activities) to individual elk. Elk may return to salvage units during hours of darkness to forage on lichens or foliage from downed trees. Harvest operations may occur during the winter season, if soil and snow conditions are favorable. However, over 3,900 acres of winter range that was unaffected by the fire would remain available for elk in the PA.

Prescribed burning would reduce slash and prepare the units for tree planting. The burns would occur in jackpots of slash. Implementation of any of the action alternatives would increase forage production on winter range by stimulating shrub production. The proposed treatments would remove dead or dying trees and allow sunlight, water and nutrients to become more available to shrubs, forbs, grasses and newly planted trees. Forage quantity would increase in harvested areas for 20-30 years or until tree canopy cover closes and forage plants begin declining.

Temporary roads would be closed to public motorized access. Upon completion of each sale, these roads would be decommissioned.

3.13.5.4.5 Elk Summer Range Existing Conditions

Summer range may overlap with wintering areas, as animals tend to move to higher elevations as the snow melts and additional forage becomes available. Important habitat components on spring, summer, and fall range include foraging sites, hiding cover, calving areas, rutting and security areas. In the unburned areas within the project boundary, the availability and abundance of understory forage in most of the mature or old growth stands are declining. Some shrub species have attained small tree status and are mostly unavailable for forage. Tree canopy cover is increasing, causing a decrease in available forb, grass, and shrub forage. Hiding cover is available in forest stands mid-seral or older.

Newly burned areas and those proposed for salvage harvest would begin to provide forage in 2-5 years, depending on the burn severity. As stands grow from seedling to sapling stage, patches of hiding cover would develop. All MAs that are able to support tree stands would provide big-game summer range within a few years post-fire.

“Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho” considers road density, livestock grazing, and cover-forage ratios and was used to evaluate summer elk range (Leege 1984). Summer range habitat effectiveness objectives were established in the Nez Perce Forest Plan for elk analysis areas (EAA). There are 3 EAAs in the Lolo analysis area. One of these areas has a very small area (approximately 230 acres) affected by the fire. Portions of one unit are proposed to harvest about 30 acres of this burned area. No new roads are planned for accessing this unit. The effects of the proposed actions would be immeasurable to this EAA, and it was dropped from analysis. The other two EAAs are analyzed in Table 3-49. The Forest Plan objective for summer range elk habitat effectiveness

(EHE) is to achieve a minimum of 25% effectiveness in each unit. Currently, all units meet the objective as noted in Table 3-49.

Table 3-49. Elk summer range habitat effectiveness by alternative in the LID analysis area

Elk Analysis Area (EAA)	EAA Acres	Forest Plan Objective (%)	Summer Habitat Effectiveness (%)			
			Alt 1 Existing	Alt 2	Alt 3	Alt 4
302017141	7102	25	58	49	53	49
304067021	6890	25	63	53	55	53

3.13.5.4.5.1 Alternative 1

In the existing condition both EAAs are in compliance with forest plan objectives of either meeting or exceeding 25% of elk habitat effectiveness (EHE). Livestock grazing is occurring in the EAAs. The Tahoe-Clear Creek pasture and like-named range allotment have about 4,900 acres in the PA, and spans the two EAAs that are analyzed. Both EAAs have a low density of roads, which are reflected in EHE values above 50%.

There would be no direct effects to summer elk habitat effectiveness under Alternative 1 because no activities are proposed or would occur. Indirectly, habitats in the area would be susceptible to future wildfires due to the accumulation of fuels resulting from dead or dying snags that would fall and add to the ground fuels over time.

Fire suppression would continue, and would limit the amount of forage created by wildfire. In contrast, suppression would limit the amount of forest burned by fire, thereby retaining more hiding cover than would result from an uncontrolled wildfire.

3.13.5.4.5.2 Alternatives 2, 3, and 4

Direct effects to elk habitat effectiveness would be from shifts in the distribution of cover and forage, roadwork and increased traffic. Alternatives 2 and 4 would drop to 49% and 53% EHE in the affected EAAs, while Alternative 3 would reduce EHE to 53% and 55% (see Table WL-5). Upon completion of the project, EHE levels would return to the existing condition found in each EAA.

Hiding and thermal cover have been reduced by the wildfire event. Hiding cover is defined as the vegetation capable of hiding 90% of a standing adult elk from a viewing distance of 200 feet or less (Thomas et al. 1979). So, hiding cover strongly influences the detection of elk, especially for humans. Thermal cover is habitat that elk may seek out as means of thermo-regulation: using vegetation to reduce wind effects, or a vegetative cover to keep in heat and/or act as an intercept for snow or rain. Thermal cover is a stand of conifers at least 40 feet tall, and the average canopy closure greater than 70% (Thomas et al. 1979). Proposed salvage harvest would create larger openings, and further reduce some hiding cover. Any harvest in areas that once offered thermal cover would have no effect, as the thermal cover would have already been lost to the effects of the fire.

Timber harvest reduces tree canopy coverage, but allows sunlight, water and nutrients to be more available to shrubs, forbs and grasses. Forage quantity would increase in harvested and burned areas for about 20-25 years. Forage representation would decline after this as the tree canopy cover increases. Burning releases nutrients that plants can use for a short-term benefit (1-2 years). Higher quality forage better prepares elk condition for winter. An increase in the quantity and quality of forage should help improve calf survival, as well.

3.13.5.4.6 Elk Security Existing Conditions

Security areas are places where wildlife can retreat for safety when affected by disturbance. In general security areas are over 250 acres in size and greater than ½ mile from an open road or trail. The Hillis (1991) guidelines for elk security area recommend that an elk analysis unit have at least 30% secure habitat. Seventeen percent of EAA 302017141 currently qualifies as elk security and EAA304067021 has 21% secure areas Security areas are displayed in Table 3-50.

Table 3-50. Security Areas in Lolo Insect and Disease Analysis Areas

Elk Analysis Area (EAA) Name	EAA Acres	Security %			
		Alt 1	Alt 2	Alt 3	Alt 4
302017141	7,102	17	11	11	11
304067021	6,890	21	12	12	12

3.13.5.4.6.1 Alternative 1

All of the EAAs possess less than the suggested amount of security habitat. The mixed severity fire reduced canopy cover and created many openings that are lacking forage. It is this lack of forage that would discourage elk from using the area until vegetation recovers. In 3-10 years, vegetation would recover and forge production would bring elk back into the burned area. Many roads in the PA are closed to public motorized access. So security from motorized disturbance is present in the area, but for elk to use these areas forage needs to be present. This alternative would not create any new roads or change present access.

Future wildfires would decrease cover in patches that are providing security. Fire suppression would restrict the loss from such fires by an unknown or immeasurable percentage.

3.13.5.4.6.2 Alternatives 2, 3, and 4

All action alternatives would reduce the percentage of security areas due to the use of existing or temporary roads to access the salvageable timber. Some temporary roads would be built, and some closed roads would be re-constructed to access proposed units. All action alternatives would drop security areas by 6% in EAA (1.) and 9% in EAA (2.) for approximately 5-10 years. Elk would move to other security areas outside of these EAAs during periods of disturbance from man and machine. Upon completion of the timber sales, these roads would be decommissioned and closed to public motorized access. Security Areas would return to their existing levels (Table 3-51) and increase over time as forage becomes available to elk.

Timber harvest and prescribed burning would reduce cover in proposed units. Again disturbance would occur to individual elk in or near to affected areas. Both activities would increase forage across the analysis area for elk and other big game in 2-10 years post-harvest operations, depending on the burn intensity the areas were affected by.

3.13.5.4.7 Shiras Moose

In Idaho, moose occur mainly in mountainous conifer forests. Moose select vegetation types where forage is abundant in all seasons. Winter range is characterized by double-canopied, coniferous forests which intercept significant amounts of snow and also provide palatable evergreen forage. Forest vegetation types used by moose include grand fir and subalpine fir, especially those areas that have a subcanopy of Pacific yew (Pierce and Peek 1984).

Moose in north-central Idaho select dense Pacific yew stands in old-growth grand fir communities during winter (Pierce and Peek 1984). Fire suppression likely increased frequency and extent of Pacific yew, but timber harvests within the same areas has reduced the extent of yew communities. Pacific yew was typically slashed and burned during the course of regeneration timber harvest practices prior to 1987 (Crawford 1983 and Stickney 1980). From 1987 to 1991, timber harvest and burning were constrained in areas allocated to moose winter range. After development of the Conservation Guidelines for Pacific yew (USDA 1992), timber harvest and burning in Pacific yew stands have been reduced considerably. Forest fragmentation from harvest has reduced patch size and interior conditions, and isolated Pacific yew stands.

Moose disperse to higher elevations during summer, where open-canopied habitats provide abundant forage. Favored summer foraging areas include lakes, creeks, meadows, 5-40 year old timber harvest units, and burned forests (Innes 2010). Even-aged pole timber stands are also used (Pierce and Peek 1984). Both riparian and upland shrub species are consumed, and favored browse species used year-round include: wouldow, menziesia, mountain maple, serviceberry, and Pacific yew.

Pierce (1983) conducted a moose habitat use and selection study on the Red River Ranger District from 1979-1982. Mature stands were used throughout the year, old growth was used more than expected during all seasons except summer, and stands containing Douglas-fir and lodgepole pine were avoided. Moose used all timber cover types in proportion to their availability from June to August.

The Nez Perce Forest Plan designated MA21 as grand fir/Pacific yew communities to be managed for moose winter range. The goal in MA21 is to manage the grand fir-Pacific yew plant communities to provide for a continuing presence of Pacific yew "suitable" for moose winter habitat. Management standards and practices for timber harvest and fire management in MA21 to help maintain suitable winter habitat are found in the Nez Perce National Forest Plan (1987; page III-59).

Population Trends: Moose are considered a big-game animal in the state of Idaho, with annual drawings rewarding a limited number of hunters. Moose have been observed throughout the project area.

3.13.5.4.7.1 Alternative 1

No activities are planned in this alternative. Moose would continue to use the habitat that is available. Old growth stands hosted 50% of moose presence during fall winter and spring, while mature stands were used throughout the year (Pierce and Peek 1984). Any areas of Pacific yew would be greatly favored by the mammal. As vegetation recovers in the burned areas, shrubs such as mountain maple, serviceberry and scouler wouldow would provide seasonally available forage for the moose.

3.13.5.4.7.2 Alternatives 2, 3, and 4

All three alternatives propose harvest in 11 acres of MA 21 moose winter range. These acres have been burned over by the Johnson Bar Fire. Noise and project activities would create possible disturbance to individual moose that may be in the affected areas. This may cause moose to avoid the area until the activities are completed. However, moose may return to harvest units during hours of darkness to feed on the foliage from trees that have been dropped to the ground by logging operations.

Approximately 5 years after the burn or harvest operations, shrubs would be recovering in the harvested areas and other areas of the low intensity burns. About 10 years post-fire, shrubs and other vegetation would be available with improved quantity and quality for moose and other ungulates.

3.13.5.4.8 Neotropical Migratory Birds

Neotropical Migratory Bird Laws - Under the National Forest Management Act (NFMA), the Forest Service is directed to “provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives” [P.L. 94-588, Section 6 (g) (3) (B)]. The January 2000 USDA Forest Service (FS) Landbird Conservation Strategic Plan, followed by the US Shorebird Conservation Plan and Executive Order 13186 in 2001, and the January 2004 PIF North American Landbird Conservation Plan all reference goals and objectives for integrating bird conservation into forest management and planning.

In late 2008, a Memorandum of Understanding between the USDA Forest Service and the US Fish and Wildlife Service to Promote the Conservation of Migratory Birds was signed. The intent of the MOU is to strengthen migratory bird conservation through enhanced collaboration and cooperation between the Forest Service and the Fish and Wildlife Service as well as other federal, state, tribal and local governments. Within the National Forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities.

Neotropical migratory birds are species that breed and rear their young in the United States and Canada, then migrate south to winter in Mexico, the Caribbean Islands, and Central and South America. The status of neotropical birds is of special concern to state and federal agencies and conservation groups. Many of these birds are experiencing serious declines in population. Some migratory birds are covered by the endangered species act, while others are managed by state hunting regulations. Most of the migratory birds on the forest are protected as non-game status by the Idaho Department of Fish and Game.

Design criteria for project activities cover potential disturbances to birds, and allow for mitigations of the project if necessary. Timber harvest techniques and prescribed burning would benefit many species of neotropical migrants that depend on shrubs and seral tree species for nesting and foraging.

3.13.5.4.8.1 Alternative 1

There would be no direct or indirect effects to neotropical migrants since no proposed activities would occur. Birds that prefer high percentages of canopy cover would have relocated from burnt areas that no longer offer such habitat, to areas outside the fire perimeter. Conversely, many bird species would be attracted to the burned areas due to the increase of insects feeding on the dead and dying wood.

3.13.5.4.8.2 Alternatives 2, 3, and 4

All action alternatives would harvest dead or dying trees in burnt areas. The alternatives would impact from 8.5-11% pf the project area. No harvest would occur in old growth or riparian areas. Noise and movement of machinery and other human activity may disturb migrant birds. The operating season, year-round for up to 3 years, may disrupt some nesting birds in or near areas of project activities. However, operations would be suspended when soil conditions become unfavorable or other weather conditions occur (fog in helicopter flight paths and so on).

All live trees, and some large burnt trees/snags and patches of snags would be retained in harvest units. This would leave some structure in units, as well as food sources for insects and birds. Individual bird pairs may lose their nests in areas proposed for salvage harvest. However, approximately 90% of the PA would not be affected by timber operations, and would continue to provide forage and nesting habitat for birds in the area.

Cumulative Effects

In accordance with NEPA and the Council on Environmental Quality (CEQ) guidelines, cumulative effects are to be analyzed as a component of any project undergoing a NEPA analysis. Cumulative effects are incremental impacts as a result of implementing an action and consist of any past, present, and reasonably foreseeable future actions on any lands regardless of the agency or person undertaking the action, to include Federal, State, and private. Cumulative effects can be individually minor but collectively significant over a period of time (40CFR 1508.7). The time and spatial area for the analysis of cumulative effects is resource dependent.

Table 3-51 – Past, Present, and Reasonably Foreseeable Future Projects within the Middle Fork and Selway Drainages

Project Name	Location	Project Type	Miles/Acres	Year(s)
Road Construction (Middle Fork)	Various[1]	Construction	1 mile	1930s
Road Construction (Middle Fork)	Various[1]	Construction	7 miles	1950s
Road Construction (Middle Fork)	Various[1]	Construction	6 miles	1970s
Road Construction (Middle Fork)	Various[1]	Construction	1 mile	1990
Road Construction (Selway)	Various[1]	Construction	6 miles	1920s
Road Construction (Selway)	Various[1]	Construction	19 miles	1930s
Road Construction (Selway)	Various[1]	Construction	6 miles	1950s
Road Construction (Selway)	Various[1]	Construction	33 miles	1960s
Road Construction (Selway)	Various[1]	Construction	34 miles	1970s
Road Construction (Selway)	Various[1]	Construction	21 miles	1980s
Road Construction (Selway)	Various[1]	Construction	5 miles	1990s
Road Reconstruction	653 Road/Lodge Creek Lodge Point Sale	Replace 5 culverts	2.2 miles	2013
Road Reconstruction	286A Road/ Lodge Creek Lodge Point Sale	Replace 4 culverts	0.9 mile	2013
Road Reconstruction	286D Road/ Lodge Creek Lodge Point Sale	Aggregate surfacing	0.2 mile	2013
Road Reconstruction	Road 651; O'Hara Creek Road	Culvert replacement; upgrade to 100 year flow	4 culverts	2015
Road Reconstruction	Upper Road 651; O'Hara Creek Road	Spot surfacing to reduce surface erosion	3 miles	2015
Road	Lower Road 651; O'Hara	Culvert replacement;	3 culverts	2017-2018

Project Name	Location	Project Type	Miles/Acres	Year(s)
Reconstruction	Creek Road	upgrade to 100 year flow		
Road Decommissioning	6 segments	Road decommissioning	4.7 miles	1990s
Road Decommissioning	13 segments	Road decommissioning	7.8 miles	1990s
Road Maintenance (Middle Fork)	All system roads	Road maintenance	7 miles/year	2016+
Road Maintenance (Selway)	All system roads	Road maintenance	10 miles/year	2016+
Wildfire	East side of project area	Wildfire	330 acres	1889
Wildfire	Northwest corner of project area	Wildfire	469 acres	1910
Wildfire	Lower $^{2}/_{3}$ of project area	Wildfire	2,157 acres	1919
Wildfire	Southwest corner	Wildfire	117 acres	1880
Wildfire	Majority of Selway area	Wildfire	8,978 acres	1889
Wildfire	Southeast corner	Wildfire	900 acres	1919
Wildfire	South central area	Wildfire	807 acres	1920
Wildfire	South central area	Wildfire	3,124 acres	1928
Wildfire	Southeast area	Wildfire	1,352 acres	1945
Wildfire	Johnson Bar Creek	Wildfire	0.5 acre	1992
Wildfire	Hot Point	Wildfire	15 acres	1999
Johnson Bar Wildfire	¾ of Middle Fork area	Wildfire	2,238 acres	2014
Johnson Bar Wildfire	Majority of Selway area	Wildfire	9,854 acres	2014
Johnson Bar Hand Fireline	1 segment on ridgetop	Fireline	1.8 miles	2014
Johnson Bar Hand Fireline	16 segments on ridgetop	Fireline	8.7 miles	2014
Johnson Bar Dozer Fireline	3 segments on ridgetop	Dozer fireline	2.0 miles	2014
Johnson Bar Dozer Fireline	4 segments on ridgetop	Dozer fireline	2.1 miles	2014
Johnson Bar Excavator Fireline	1 segment on ridgetop	Excavator fireline	1.2 miles	2014
Johnson Bar Fuel Break	Road 651, 9701, and 9723B	Install drop inlet structures, including lid at cross drains	31 drop inlets and 7 lids	2014
Johnson Bar fire BAER Work	652 Road	Culvert removal	1 culvert	2014
Pre-commercial Thinning	011707A020300087000	Pre-commercial Thinning	13 acres	2005
Pre-commercial Thinning	011707A020300093000	Pre-commercial Thinning	3 acres	2005
Pre-commercial Thinning	011707A020300118000	Pre-commercial Thinning	4 acres	2005
Pre-commercial Thinning	011707A020300121000	Pre-commercial Thinning	11 acres	2005
Pre-commercial	011707A020200053000	Pre-commercial	31 acres	2013

Project Name	Location	Project Type	Miles/Acres	Year(s)
Thinning		Thinning		
Pre-commercial Thinning	011707A130100004000	Pre-commercial Thinning	26 acres	2013
Pre-commercial Thinning	011707A130100006000	Pre-commercial Thinning	20 acres	2013
Pre-commercial Thinning	011707A130100008000	Pre-commercial Thinning	15 acres	2013
Pre-commercial Thinning	011707A140100121000	Pre-commercial Thinning	9 acres	2013
Pre-commercial Thinning	011707A140100126000	Pre-commercial Thinning	6 acres	2009
Pre-commercial Thinning	011707A140100127000	Pre-commercial Thinning	14 acres	2013
Pre-commercial Thinning	011707A140300002000	Pre-commercial Thinning	14 acres	2013
Pre-commercial Thinning	011707A140300010000	Pre-commercial Thinning	10 acres	2013
Pre-commercial Thinning	011707A140300018000	Pre-commercial Thinning	30 acres	2013
Pre-commercial Thinning	011707A140400037000	Pre-commercial Thinning	23 acres	2013
Range	South end (Tahoe-Clear Creek Grazing Allotment)	Cattle grazing	2,150 acres	1930s-foreseeable future
Range	South end (Tahoe-Clear Creek Grazing Allotment)	Cattle grazing	2,757 acres	1930s-foreseeable future
653 Trail Recreation Use	Lodge Point to Two Shadows	Trail maintenance/use	3.5 miles	1930s-1970s
706 Trail Recreation Use	Hot Point	Trail maintenance/use	4 miles	1930s-present
712 Trail Recreation Use	Peterson Point	Trail maintenance/use	8 miles	1930s-1990s
716 Trail Recreation Use	Swiftwater	Trail maintenance/use	3 miles	1930s-1970s
706 Trail Recreation use	Hot Point	Trail maintenance/use	4 miles	2016+
Snowmobile Routes	Roads 286, 286A, and 653	Snowmobile recreation	56 miles	1970s-present
Snowmobile Routes	Roads 289, 470, 651, 1119, 1121, 1129, 9701, and 972	Snowmobile recreation	33 miles (within project area)	1970s-present
Snowmobile Routes	Roads 286, 286A, and 653	Snowmobile recreation	56 miles	2016+
Snowmobile Routes	Roads 289, 470, 651, 1119, 1121, 1129, 9701, and 972	Snowmobile recreation	52 miles	2016+
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	80 acres	1950s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	440 acres	1960s
Clearcut harvesting	Various[2]	Activity 4111, 4113,	906 acres	1970s

Project Name	Location	Project Type	Miles/Acres	Year(s)
		4117; clearcut		
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	49 acres	1990s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	101 acres	2000s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	325 acres	1960s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	680 acres	1970s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	233 acres	1980s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	937 acres	1990s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	257 acres	2000s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	26 acres	1960s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	30 acres	1970s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	23 acres	1990s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	121 acres	2005
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	130 acres	1980s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	46 acres	1990s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	14 acres	2005
Commercial Thinning	Various[2]; include Lodge Point acres	Activity 4220	450 acres	2010
Commercial Thinning	Various[2]; include Lodge Point acres	Activity 4220	135 acres	1980s
Commercial Thinning	Various[2]; include Lodge Point acres	Activity 4220	148 acres	2000
Salvage	Various[2]	Activity 4151 and 4231	286 acres	1970
Salvage	Various[2]	Activity 4151 and 4231	77 acres	1980
Salvage	Various[2]	Activity 4151 and 4231	539 acres	2000
Salvage	Various[2]	Activity 4151 and 4231	13 acres	1960s
Salvage	Various[2]	Activity 4151 and 4231	193 acres	1970s
Salvage	Various[2]	Activity 4151 and 4231	164 acres	1980s
Salvage	Various[2]	Activity 4151 and 4231	190 acres	1990s
Salvage	Various[2]	Activity 4151 and	47 acres	2000s

Project Name	Location	Project Type	Miles/Acres	Year(s)
		4231		
Lodge Point Sale	Lodge Point	Stewardship sale	598 acres of commercial thinning; open 4.3 miles of old roads and decommission when done; construct 1.1 miles of new temporary roads and obliterate when done; chip/haul 2,800 tons of biomass	2013-2015
O'Hara Hazard	O'Hara Campground	Hazard timber sale	30 dead trees	2014
Clear Creek Timber Sale	Clear Creek	Timber sale	4156 acres regeneration; 4,551 acres intermediate	2015-2022
Lowell Wildland-Urban Interface (WUI)	North and east of Lowell	Timber sale	160 acres	2016
Private Timber Harvest	Mouth of Selway River	Salvage/regeneration	80 acres	2014
State of Idaho Timber Harvest	South of Swiftwater Creek	Salvage/regeneration	167 acres; 3 miles permanent roads	2015
Landslide	Stand 01170714040060	Landslide	250 feet by 1,200 feet	1995/1996
Landslide	Stand 01170713020099	Landslide	100 feet by 650 feet	1995/1996
Clear Creek Prescribed Fire	Clear Creek Roadless Area	Prescribed fire	1,371 acres	2015-2017
Fenn Face	North of Fenn Ranger Station	Prescribed fire	1,000 acres	2016
North Selway	Southwest of Coolwater	Prescribed fire	1,000 acres	2017

[1]See GIS layer and historic road data spreadsheet

[2] See GIS layer for stands

3.14 Cultural

The cumulative effects area is the entire Johnson Bar Project area. Project mitigation and design criteria have been identified and would be implemented to avoid impacts to all NRHP eligible sites. Because all project activities would be conducted consistent with the National Historic Preservation Act and the Nez Perce National Forest Plan, the implementation of these activities would result in "no effect". Thus, there would be little potential for project activities to produce or contribute to negative effects that would be cumulative with other actions.

3.15 Economics

The cumulative effects area of analysis is Clearwater, Idaho, Lewis, and Nez Perce counties in Idaho. The timber sale logging contract would last approximately 3 years in order to complete the timber harvest and road decommissioning and is proposed for sale in 2016. Post-harvest reforestation, consisting of hand planting, would continue for up to 3 years following the timber harvest, for a total of up to 6 years of activities (some planting would likely overlap with the logging years, thus reducing the total activity period). Operations would continue year-round unless specific conditions of resource damage or consequences are defined. Harvest operations are expected to last 3-4 years, preparation of sites for tree planting would occur 2- 3 years post-harvest, and planting would occur during the growing season after any prescribed burns.

Economic impacts for an activity, such as logging and sawmilling lumber, are shown in the previous section. These are described as direct and indirect effects, but they are also cumulative impacts due to the additional jobs, taxes, and income they provide throughout the Counties. When considering impacts of additional jobs and income created, this sale would contribute towards the Forest's 5-year timber sale plan, but not beyond the level of current employment. The Nez Perce-Clearwater National Forest 5-year timber sale plan is currently projected to be about 60 million board feet (MMBF) per year. Sold or foreseeable local sales affecting the same communities and contributing to the long-term timber flow of these communities include Swede, Preacher Dewey, Lochsa Thin, Clear Creek, Lowell WUI, and Lolo Insect and Disease. The State of Idaho has plans to harvest trees in 2015 on State lands that burned, which would also contribute to timber flow in the area, in addition to the annual State and private timber outputs. Some of the private lands burned in the fire were harvested during the winter of 2014/2015.

3.15.1 Alternative 1

Since this alternative would not propose any timber harvest or road decommissioning it would not contribute cumulatively to the local community jobs and income. It would maintain current unmanaged use and related income. It potentially could contribute toward future fire fighting costs as the dead trees rot and fall over and contribute to the fuels loading over the next 20 years.

3.15.2 Alternatives 2, 3, and 4

The following cumulative effects are common to Alternatives 2, 3, and 4.

Added to the Forest 5-year timber sale plan, these alternatives would create the same amount of jobs and income. However, these alternatives are not expected to generate an excessive amount of jobs or income from timber harvest or road work to cumulatively effect the local communities beyond the past three year employment averages, because the mills would adjust their timber harvest to match their production goals. This could mean that some sales would be delayed in being harvested, so the purchaser can harvest the higher priority dead Johnson Bar timber before it loses merchantablity.

3.15.3 Irreversible and Irretrievable Commitment of Resources

None known or suspected. From an economic standpoint, harvest and utilization of the merchantable timber at this time is the lowest risk to loss of economic value. Continued deterioration, fire, insects, disease, and other natural events could reduce the existing monetary value of the trees in the analysis area.

3.15.4 Adverse Effects Which Cannot Be Avoided

None known or suspected.

3.16 Fire and Fuels

The cumulative effects geographic boundary for fuels is the fire perimeter area because project activities would have localized effects on fuels and fuel continuity. This area is sufficient to display effects. The time frame for cumulative effects is 40 years.

The only activities considered for cumulative effects to fuels are those management activities that may increase or decrease fuels over the next 40 years. The only Forest Service activity considered for cumulative effects is fire suppression/exclusion. Until the current Forest Plan changes, this area would remain primarily a full response suppression zone. Fuels would continue to accumulate in the non-treated areas and be well above the preferred levels (See Figure 1).

The Idaho Department of Lands proposal to harvest 160 acres would add additional reductions in fireline intensity and resistance to control as described for the Salvage alternatives. The 80 acres of harvest on private lands would provide the same benefit. There are no current or reasonably foreseeable future activities that would affect fuels within the cumulative effects area.

3.16.1 Alternative 1 – No Action

There would be minimal benefit because of the small size and location of treatments within the valley, although location near private property would be beneficial.

3.16.2 Alternative 2, 3, and 4

There would be a positive cumulative effect associated with the Action Alternatives because this would extend the benefits of the treatments further into the river corridor and onto lands outside of the National Forest Service administered lands.

3.17 Hydrology

The cumulative effects area consists of the nine Forest Plan Prescription watersheds in which the proposed project activities would occur, plus the 6^{th}-HUC watersheds within the proposed project area: Big Smith Creek-Middle Fork Clearwater, Goddard Creek-Selway River and O'Hara Creek Subwatersheds (Table 3-5).

Cumulative effects arise from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions. Based on the analysis presented in this report, the Johnson Bar salvage project was not predicted to incrementally add to cumulative impacts to water resources in the analysis area, because net effects to each management indicator were predicted to be neutral or positive. Management indicators of sediment delivery from roads and from treatment units and road density all showed short and long-term improvements as a result of project activities. Where road maintenance and decommissioning activities occur near streams, short-term (<1 year) increases to sediment delivery are also likely. Impacts to ECA (and water yield) were predicted to be negligible. Given that the project activities in total were predicted to result in net reductions in erosion, sediment delivery to streams, and improvement to the general watershed condition, a quantitative evaluation of past, existing and foreseeable impacts was not done—these impacts are discussed qualitatively in this section.

Time Frame: The temporal scale of the analysis for direct, indirect, and cumulative effects ranges from one to five years. The potential for short-term increases in erosion and sediment delivery associated with road decommissioning would last as long as soil is disturbed or exposed. Once vegetation and groundcover have stabilized disturbed ground surfaces, decommissioning-related impacts would not be expected to persist. For management activities on treatment units, the potential for sediment delivery would be highest during project activities and in the first year following disturbance. The required application of slash during and immediately after tree removal activities would lead to substantially higher groundcover than in the existing burned condition of many of the units, and thus would leave units less prone to erosion than in the existing burned condition. Treatment units would generally recover to pre-fire conditions at a similar pace as similar untreated burned areas—within approximately three to five years.

Geographic Boundary: The extent of cumulative watershed effects is dependent on the scale of the watershed. The magnitude of changes in water and sediment yield is inversely proportional to stream order (MacDonald 1989), so potential changes would be more likely to be detectable higher in the watershed. Thus, cumulative effects are analyzed at the scale of the 6^{th}-HUC drainage.

Potential increases in erosion and sedimentation within the analysis area could be attributed to fires (notably the Johnson Bar fire) or other past, present, or future management activities. Past projects and disturbances that affect erosion and sedimentation include timber sales and thinning projects. Roads, trails, and dispersed recreations sites are semi-permanent features within the analysis area that affect erosion and sedimentation. Ongoing and upcoming projects include timber sales and forest restoration, fuels reduction projects, firewood cutting, invasive weed control, and road maintenance. Recent and future restoration projects in the analysis area include BAER treatments and fire suppression rehabilitation for the Johnson Bar fire, and culvert replacement projects on O’Hara Creek. Although there are numerous projects, disturbances, and semi-permanent features within the analysis area, the Johnson Bar fire is the largest factor that could affect erosion and sedimentation within the analysis area.

The burned area itself is at increased risk for elevated runoff, erosion, and sediment delivery to streams. The sediment filtration capacity of near-channel vegetation was reduced along some streams by the fire, which could increase erosion and sedimentation risk. The proposed project would not add to this effect because no RHCAs would be treated. Moreover, treatment units would have fine and coarse slash scattered to achieve at least an 85% ground cover, greatly reducing probability of erosion and transport of sediment. Increased risk of erosion and sedimentation from tree mortality in RHCAs would generally be of relatively short duration with early seral vegetation providing soil protection within 2-3 years. Roughly fifteen percent of RHCA acreage within the burn perimeter experienced moderate to high burn-severity effects (see Fisheries report). Given that most riparian areas in the project area were unburned or burned with low-severity effects, riparian buffers would continue to function as sediment filters for potential runoff from surrounding burned hillslopes.

Long-term sedimentation from the road system in the project area would likely be reduced due to approximately 5 miles of road placed into storage, 21 miles decommissioned, 10 miles reconstructed, and 58 miles under pre-haul or routine road maintenance as an action associated with the timber sale. Restriction of haul to dry or frozen conditions on hydraulically connected haul routes would minimize risk of sediment delivery from roads from haul operations. Future culvert replacement projects on O'Hara Creek should reduce risk of culvert failure at these crossings. Road improvements through the BAER process, as well as general road maintenance activities would also reduce erosion and sedimentation from the road system and burned area within the project area. Up to 4 miles of new temporary road and up to roughly 1 mile of swing trail are proposed for the project, depending on alternative. None of these routes was determined to be hydraulically connected to any stream channel, and were not predicted to be sources of sediment to project-area streams.

Fire line construction from suppression efforts for the Johnson Bar fire could increase erosion and sedimentation risk, especially in areas where concentrated flow from these features could enter the stream system. However, no sediment delivery from firelines was observed after fall 2014 storms. These features were rehabilitated following the fire, and conditions on fire lines should improve as vegetation recovers. Fire lines do not overlap with salvage units.

The increase in ECA in each 6th-HUC drainage in the project area was predicted to result in a water yield increase that would be at the margins of detectability. Nonetheless, potential increases in water yield and peak flows as a result of the Johnson Bar fire could contribute to bank instability. Sedimentation could also potentially increase in streams within the analysis area from increases in bank instability, peak flows, and increases in overland flow and erosion from the burned area. However, the Johnson Bar salvage project would not affect these parameters because there would be minimal project-related erosion or sedimentation to streams, and project activities were not predicted to affect water yield and magnitude of peak flows.

Temperature data for streams in the analysis area are discussed in the fisheries report for this project. Tree removal and other disturbance in Riparian Reserves can reduce stream shade and increase channel exposure to solar radiation. Decreases in riparian vegetation can also exacerbate channel erosion and widening, leading to warmer stream temperatures from increased surface area. However, project activities are not predicted to measurably influence stream temperature, primarily because no harvesy would occur in RHCAs.

Large woody debris loading within streams and RHCAs is expected to increase in the next 1-10 years as dead trees begin to fall. Down wood adjacent to streams would contribute to in-stream and floodplain large woody debris recruitment, store sediment, and increase channel complexity. A recent study found that in wilderness areas, riparian areas burned at different severities (mosaic) may drive a “fire pulse” that increases aquatic and riparian area productivity (Malison and Baxter, 2010). Increases in large woody debris loading could also increase channel instability in some locations. Over the long-term, large wood recruitment to streams would be reduced as new trees are established. The proposed project would not affect large woody debris recruitment because no trees would be removed from RHCAs.

Approximately five miles of Forest Service roads in the Middle Fork Clearwater River subwatershed and approximately eight miles of Forest Service roads were decommissioned in the Goddard Creek-Selway River subwatershed since 1990. Recent road improvement activities, including culvert upgrades and drain structure installation, have occurred in the Goddard Creek-Selway River subwatershed in 2015. These activities produced localized short-term sediment during implementation, but created long-term sediment reductions and benefits to overall channel conditions.

Present actions include permitted grazing, recreation, fire suppression, road maintenance, and control of noxious weeds using chemical, mechanical, and biological control methods. Recreational activities produce little to no impacts to water quality or quantity or floodplain/wetland functions. Impacts of recreation on water quality are related primarily to associated road use, especially during wet conditions. Effects from grazing include stream bank instability and reduced water infiltration rates in areas where soil was disturbed or compacted (localized areas). Fire suppression activities are infrequent and limited in scope, and road maintenance has minimal short-term effects and long-term benefits (Burroughs and King 1989).

Forest practices have changed over the last few decades. Project design measures, Best Management Practices, and Forest Plan guidelines have been developed in order to reduce ground disturbance and subsequent erosion and sediment delivery. Operating under dry or frozen conditions, implementing PACFISH buffers, retention of trees in regeneration harvest units, and limiting ground-based yarding to slopes less than 35 percent are now common practices.

The following foreseeable future or concurrent actions would occur in the Middle Fork Clearwater River (6^{th}-HUC):

- Tahoe-Clear Creek Allotment - continued grazing of 2,150 acres

- Clear Creek Inventoried Roadless Area Prescribed Burn –burning activities (2015-2017) affecting 1,371 acres
- Continued road maintenance on all Forest Service system roads – 7 miles/year
- Snowmobile Recreation – additional 56 miles (9miles in project area) of routes would be added starting 2016

The following foreseeable future or concurrent actions would occur in the Goddard Creek-Selway River and O'Hara Creek subwatersheds (6th-HUC):

- Road Improvements – upgrade three culverts on O'Hara Creek Road #651 to accommodate one percent probability (100-year) flood event (2017-2018)
- Range –continued grazing 2,760 acres
- Fenn Face Prescribed Burn – burn activities (2016) north of Fenn R.S. affecting approximately 1,000 acres
- North Selway Prescribed Burn – burn activities (2017) southwest of Coolwater affecting approximately 1,000 acres
- Continued road maintenance on all Forest Service system roads – 10miles/year
- Pre-commercial thin – thinning (starting 2016) activities located from Swiftwater to O'Hara Creek

A coming salvage sale on state land burned in the Johnson Bar fire is also likely to have sediment impacts based on the severity of the burn on this land, the length of new road construction, and the less stringent BMPs applied on state land.

3.17.1 Alternative 1

Cumulative effects arise from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions. There are no direct or indirect effects from this project; therefore there are no cumulative effects.

3.17.2 Alternatives 2, 3, and 4

Water Yield: As discussed above, percent increase in equivalent clearcut area (ECA) can be used as an indicator of change in water yield resulting from reductions in forest canopy. In this project, removal of live trees would be minimal, but could occur at incidental levels in the construction of temporary roads and skyline corridors. A lower ECA values corresponds to a lower likelihood that undesirable effects of increased water yield (e.g. elevated channel and bank scour) would occur. An ECA value of less than 15 percent is unlikely to result in measurable change in water yield, a condition rated as "high" or healthy by NOAA Fisheries (1998). An ECA value of 15-30 percent could potentially result in measurable increase in basin water yield, and indicates "moderate" conditions, while a value greater than 30 percent is considered low (poor) condition (NOAA 1998). Hydrologists of the Northern

Region have used an ECA value of 20-30% of a watershed (typically a 6th-HUC drainage), as a ‘yellow flag’ warning of possible deleterious effects (Haupt 1967, Gerhardt 2000, MacDonald and Stednick 2003).

The Johnson Bar fire resulted in the mortality of large numbers of trees, and brought the condition of two of the three subwatersheds evaluated in this analysis from high condition to moderate condition by NOAA Fisheries standards (1998). The highest existing condition ECA (Goddard Creek-Selway River) still remains below 20%, a threshold considered to be below a measurable level of water yield change (MacDonald and Stednick, 2003). The estimated increase in ECA due to project activities is approximately zero to 0.5% depending on subwatershed and alternative (Table 3-18). When added to the existing condition ECA, the resulting cumulative ECA after project activities would range from 3.1 to 20.3 percent depending on subwatershed and alternative. None of the alternatives would result in a meaningful increase in ECA because all of the alternatives plan only to cut dead trees, with the potential for incidental removal of isolated green trees at landings, temporary roads, and skyline corridors. The small number of green trees potentially removed would not measurably impact water yield. Thus, no stream channel alteration is expected from the Clear Creek project.

Sediment Yield: Although the NEZSED model did predict a modest increase in sediment due to project activities, it was well below that allowable under Forest Plan Appendix A (Table 3-23). Moreover, the majority of the project-related increase in sediment load estimated by NEZSED was due to decommissioning of roads. Based on a more detailed WEPP analysis of treatment units and roads in the project area, the project is predicted to result in reduced probability and magnitude of erosion and sediment delivery from roads and treated hillslopes. Thus, the cumulative sediment effects of the project would be a net reduction of hillslope erosion and sediment delivery to streams in the analysis area.

Road densities in project-area drainages would be reduced in five out of nine forest plan prescription watersheds covered by the Johnson Bar Salvage project area (Table 3-22). Road density in the remaining four drainages would remain the same as in the existing condition as there is no road decommissioning proposed in these basins.

3.17.3 Irreversible and Irretrievable Commitment of Resources

There are no effects to watershed resources in the Selway or Middle Fork Clearwater River basins from this project that are considered to be irreversible or irretrievable.

3.18 Fisheries

Given the size of the proposed project area and the fact that potential effects as a result of the proposed action alternatives would be non-measurable, cumulative effects are being analyzed at the 6th HUC subwatershed level. Only activities that may potentially affect native fish populations and their respective habitats were analyzed for cumulative effects.

3.18.1 Alternative 1

Under Alternative 1 (No Action), there would be no proposed harvesting, prescribed fires, road maintenance or construction, or road decommissioning. Therefore, Alternative 1 would not incrementally add to the effects from other past, present, and reasonably foreseeable future activities.

3.18.2 Alternatives 2, 3, and 4

The following cumulative effects are common to Alternatives 2, 3, and 4.

Past vegetation treatments have been conducted over the majority of the proposed project area. Prior harvest activities (1930s-2015) include salvage, commercial thinning, shelterwood harvesting, and pre-commercial/non-commercial thinning. Potential effects of harvesting activities have been summarized in the Environmental Effects section. There were approximately 3,700 acres of past harvesting activities in the Big Smith-Middle Fork Clearwater subwatershed and 3,600 acres in the Goddard-Selway and O'Hara subwatersheds. Approximately 400 acres of past harvesting activities occurred within RHCAs. The majority of this harvesting occurred over 20 years ago with opportunities for regrowth. There have been no past vegetation treatments in perennial fish bearing streams within the subwatershed. With the exception of pre-commercial thinning in the Selway-Goddard and O'Hara Creek watersheds, there would be no additional vegetation treatments having temporal/spatial overlap within the analysis area. Given this, the possible increase of sedimentation mobilization, and riparian effects from past vegetation treatments and connected actions would be negligible and offer little opportunity for measurable cumulative effects with ongoing actions for all proposed Alternatives. There would also be negligible cumulative effects to fisheries as a result of the Johnson Bar fire suppression efforts, Johnson Bar BAER efforts, Middle Fork vegetation project, private land salvage, O'Hara culvert replacements, road construction and reconstruction, road maintenance, or grazing.

The proposed project alternatives in conjunction with the 167 acre State of Idaho timber harvest south of Swiftwater Creek would result in measurable cumulative effects to fisheries within the analysis area. The State of Idaho salvage sale would consist of a combination of ground based and skyline harvesting activities along with 3 miles of permanent roads. Harvesting activities would occur within 300 feet of the Swiftwater Creek and also on landslide prone areas. Short- and long-term effects could include increased surface erosion from harvesting activities and road construction. Harvesting on landslide prone areas could increase the risk of mass failure and the delivery of sediment directly into Swiftwater Creek. New permanent road construction on landslide prone areas could be a source for chronic sedimentation and downstream pulse delivery to the Selway River, along with contributing to an overall increase in watershed road density and drainage network. Removal of vegetation within 300 feet of Swiftwater Creek could affect future large wood recruitment in both the long- and short-term.

The 25 miles of proposed road decommissioning and road storage in conjunction with the approximately 4.7 miles of decommissioned roads within the Middle Fork Clearwater drainage and 7.8 miles in the Selway-Goddard subwatershed would result in measurable positive cumulative effects within the analysis area.

Table 3-52: Johnson Bar cumulative effects to Fisheries common to all subwatersheds

Activity	Past	Ongoing	Future	Direct effects	Indirect effects	Rationale
Johnson Bar Fire Suppression Efforts	X			0	-/0	Approximately 10.5 miles of handline, 4 miles of dozer, 1.2 miles of excavator fireline were constructed and then consequently obliterated after the fire. There was also 3.1 miles of mechanical fuel break. All activities were ridge top and used existing road infrastructure (perimeter of the fire). All handline and mechanical line (39 miles) was rehabbed in Sept/Oct 2014. The majority of the work did not occur within RHCAs. Mechanical dozer line crossed several ephemeral draws to O'Hara Creek. There was no mastication that occurred within RHCAs. Given the location of past activity within the project area, duration of past activity, and past rehab efforts **there would be negligible cumulative effects to fisheries from Johnson Bar suppression efforts.**
Johnson Bar BAER Efforts	X			S-/S+	S-/S+	Culvert removal on lower Elk City Creek, (partial passage barrier, undersized) 2015, direct impacts to fisheries and immediate short-term sedimentation impacts with long-term benefits to stream channel stability and fish distribution. Road improvements along FS 651 Rd, 9701 and 0723B include 31 drop inlet structures. **There would be no cumulative effects from sedimentation impacts because there is no temporal overlap between proposed project work and road improvements were isolated with long-term beneficial cumulative effects.**
Lodge Point Project	X			0	-/0	This 598 acres commercial thin was proposed in upper Lodge Creek. A combination of tractor and skyline methods were used. 4.3 miles of old system roads were reopened. 2.0 miles were decommissioned 2013/2014, and 2.3 miles would be decommissioned in 2015 along with 1.1 miles of new temporary road. Indirect sediment impacts are reduced because there were no RHCA treatments, or temp road construction within RHCAs or culvert upgrades on existing road prism. No net drainage increase because all roads are obliterated after use. Any short-term sediment increases would likely have no measurable impacts to steelhead rearing and spawning habitat 1.5 miles downstream. **Cumulative effects to fisheries would be insignificant given project design criteria, location to occupied fish habitat and no temporal overlap with proposed activities**.
Middle Fork Vegetation Project	X			0	-/-	2586 acres were treated, it was a mixture of skyline and ground based operations. 3.9 miles of road was constructed, 3.3 miles of road was reconstructed and 3.4 miles of road was obliterated. There was an increase in drainage network. There was no harvest within RHCAs and landslide prone was eliminated from harvest units. **Cumulative effects to fisheries would be insignificant given project design criteria, location to occupied fish habitat and no temporal overlap with proposed activities**.
Private Land Salvage	x			-	S-/S-	80-acre salvage, 2 permanent landings and unknown mileage of road construction/reconstruction. There was harvest of trees within 100 feet of Swiftwater and regen harvest within 300 feet of the stream. There was no landing construction just outside of the RHCA. All landings and permanent road were constructed on unstable soils conditions. There is possible sediment delivery directly to Swifwater Creek, and the Selway River through steep ephemeral draws. Harvest within the riparian areas would most likely affect short and long-term LWD recruitment potential to lower Swiftwater. Given past harvest activities, unstable soils, and proximity to occupied fish habitat on Swiftwater, there could be significant cumulative effects. **Cumulative effects to the Mainstem Selway could be minimal given the size of the Selway and available habitat.** Peak flow events on the Selway would likely dilute any increased turbidity from the project area.
IDL Salvage	X	X		-	S-/S-	A 167-acre salvage sale, combination of ground based (98) and skyline (68) and 3 miles of permanent road. Harvest of 100% of the area with 50-foot buffers on perennial non-fish bearing streams and wetland areas and a 100-foot riparian buffer on Swiftwater Creek. Harvest would occur within 300 feet of Swiftwater Creek. Harvest would occur on landslide prone areas

Activity	Past	Ongoing	Future	Direct effects	Indirect effects	Rationale
						along with 3.0 miles of permanent road construction. Short and long-term impacts would include increased surface erosion from harvest units and road construction. Ground based harvest on landslide prone areas increase the risk of mass failure and delivery of sediment directly into Swiftwater Creek. The permanency of the new road construct (overall increase in watershed road density and drainage network) on landslide prone areas could be a source for chronic sedimentation and downstream pulse delivery to the Selway River. Removal of vegetation within 300 feet of Swiftwater Creek could affect future large wood recruitment short and long-term. Given the proposed activities and spatial and temporal overlap with the proposed Johnson Bar Salvage project and adjacent private salvage operations and distance to occupied fish habitat and Steelhead DCH, **there could be measurable cumulative effects to fisheries within the analysis area.**
O'Hara Culvert Replacements	X	X	X	-/0	S-/S+	7 total culvert replacements on non-fishing bearing streams. There would be short-term, measurable downstream increases in sediment turbidity to O'Hara creek but, overall long-term reduction in sediment inputs with culvert upgrades and resurfacing of USFS 651 Rd. **There would be negligible CE, given BMPs, duration and isolation of the activity short-term impacts would be minimized with overall benefits to the watershed with reduction in sediment.**
Road Decommissioning	X			-/0	S-/S+	Approx. 4.7 miles of past road decom in the Middle Fork Clearwater drainage more specifically Lodge Creek SWS, and approximately 7.8 miles in the Selway-Goddard SWS. **Past road decommissioning and the proposed 25 miles of road decommissioning (system and non-system) and road storage would have positive significant CE, with long-term watershed benefits.**
Road Construction/Reconstruction	X			-/0	-0	Past road construction during the 1960s-1980s. No future road construction is proposed, **CE would be negligible given no temporal or spatial overlap with proposed activities.**
Road maintenance	X	X	X	-	+	Road maintenance is ongoing, activities are consistent with the Nez Perce Plan and Road Maintenance and Minor Road Reconstruction Programmatic**. CEs would be insignificant or discountable given BMPs.**
Grazing	X	X	X	-	-	Grazing would be authorized in the Clear-Tahoe Allotment, a small portion of this allotment is located within the project area. Given the majority of fish bearing reaches and most riparian areas are wholly inaccessible to cattle, Forest designated monitoring areas (DMA), modified PIBO sites are located in adjacent watersheds. PIBO data as implicated a static or downward trend in some habitat parameters. There are is one PIBO EM site located in Goddard Creek. DMAs are consistent with Nez Perce Plan standards and guidelines and R1 utilization standards/guidelines. Although there is spatial and temporal overlap, given current utilization standards, rangeland and DMA monitoring for Clear-Tahoe Allotment **CEs would be negligible. Grazing impacts are also mitigated by using appropriate BMPs, and project specific design criteria applied uniformly across the project area.**
Instream Watershed Restoration	X			-	+	During the 1990s a successful large instream habitat improvement project placed several LWD structures to increase pools and side channel rearing habitat. Instream habitat improvements would continue to benefit fisheries in Lower O'Hara**. Past instream work and proposed culvert upgrades, and proposed road decommissioning could have beneficial CEs to lower O'Hara Creek.**

0=Neutral Indirect Effects
- =Insignificant or discountable negative effects
+ = Insignificant or discountable positive effects
S- = Measurable negative effects
S+ = Measurable positive effects
/ = Short-term/long-term effects

Table 3-53: Determination of Effects by Alternative

Species and DCH	Determination		Rationale
	Alternative 1 Fire Effects[1]	Action Alternatives 2-4	
SR Steelhead and DCH	LAA	LAA	Under Alternative 1, adverse effects to Steelhead are limited to short-term increases in sediment deposition and altered hydrologic process post-fire but, overall post fire disturbance would have long-term benefits to fisheries with increased fish densities and habitat complexity (Table 3-23). Proposed harvest activities with Project specific design criteria and BMPs would have negligible direct or indirect effects to steelhead under all Alternatives, however, connected actions such as road upgrades/decommissioning could have measurable downstream short- term increases of sediment but, with potential long-term watershed benefits. Cumulative effects specifically, salvage operations on IDL and private lands could have negative measurable effects to Steelhead and habitat given duration and magnitude of proposed actions and proximity to occupied steelhead habitat in lower Swiftwater (Table 3-52). The Effects Determination between Alternatives does not differ because NEZSED and FISHSED models indicate that increased sediment yields from proposed activities under all action alternatives are not significantly greater than modeled post-fire sediment effects in Alternative 1 and returning to existing baseline conditions 2-3 years later. Percent decrease in habitat rearing potential was not detected with FISHSED in most prescription watersheds (Appendix C).
SR Fall Chinook and DCH	NLAA	NLAA	Adverse post-fire effects to Fall Chinook and DCH are very limited. Post fire effects described on pages 13-15 are minimized/less detectable on the mainstem Selway and MF Clearwater given channel size and available habitat for salmonids. Proposed harvest activities with Project specific design criteria and BMPs would have negligible direct or indirect effects to Fall Chinook under all Alternatives. Given Fall Chinook distribution is primarily limited to the Selway and MF Clearwater, connected actions such as road decommissioning efforts and cumulative effects would have negligible effects.
CR Bull Trout and DCH	NLAA	NLAA	Adverse effects to bull trout and their DCH. Post fire effects described on pages 13-15 are minimized/less detectable on the mainstem Selway and Middle Fork Clearwater given channel size and available habitat for salmonids. Proposed harvest activities with Project specific design criteria and BMPs would have negligible direct or indirect effects to bull trout under all Alternatives. Given bull trout distribution and the fact that they use the Middle Fork Clearwater and Selway rivers primarily for FMO (Maps 5 and 6), connected proposed actions such as road decommissioning efforts and additional cumulative effects would have negligible effects to CR bull

Species and DCH	Determination		Rationale
	Alternative 1 Fire Effects[1]	Action Alternatives 2-4	
			trout and their DCH.
Chinook EFH	NLAA	NLAA	Refer, to Fall Chinook comments. Proposed harvest activities with Project design criteria and BMPs would have negligible direct or indirect effects to EFH under all Alternatives. Given location of EFH to proposed activities post-fire and cumulative effects would have or negligible effects to EFH.

[1] The Effects Determination between Alternatives does not differ because NEZSED and FISHSED models indicate that increased sediment yields from proposed activities under all action alternatives are not significantly greater than modeled post-fire sediment effects in Alternative 1, refer to Hydrology specialist report).

Table 3-56: Determination of Effects to Regional Sensitive Species

R1 Sensitive Species	Determination		Rationale
	Alternative 1 No Action	Alternatives 2-4 Action Alternatives	
Spring Chinook Salmon	MIIH[3]	MIIH	Refer, to Fall Chinook comments. Proposed harvest activities with Project specific design criteria and BMPs would have negligible direct or indirect effects to Spring Chinook under all Alternatives. Given location of EFH to proposed activities post-fire and cumulative effects would have limited or negligible effects to EFH.
Interior Redband trout	NI[2]	NI	No known isolated populations of Interior Redband trout have been documented. Refer to Steelhead Effects Determination.
Westslope Cutthroat Trout (WCT)	MIIH	MIIH	Under Alternative1, adverse effects to WCT are limited to short-term increases in sediment deposition and altered hydrologic process post-fire but, overall post fire disturbance would have long-term benefits to fisheries with increased fish densities and habitat complexity (Table 3-23). Project design criteria, BMPs and logging system methods and temp road construction would have negligible direct or indirect effects to steelhead under all Alternatives; however, connected actions such as road decommissioning could have measurable short-term increases of sediment but, with potential long-term watershed benefits. Cumulative effects specifically, salvage operations on IDL and private lands could have negative

[3] May Impact Individuals and Individual Habitat but, is not likely to result in a trend toward federal listing, and continued viability is expected on NPCLW NF
[2] No Impact to Individuals and Individual Habitat.

R1 Sensitive Species	Determination		Rationale
	Alternative 1 No Action	Alternatives 2-4 Action Alternatives	
			measurable effects to WCT habitat given proximity, duration and magnitude of proposed actions to occupied WCT habitat in lower Swiftwater (Map 5).
Pacific Lamprey	MIIH	MIIH	Post-fire effects are less detectable on the Selway and MF Clearwater rivers. Given location of occupied habitat on the Selway and MF Clearwater river, proposed project activities with design criteria, BMPs and logging system methods and location of temp road construction would have negligible direct or indirect effects to Pacific Lamprey under all proposed Alternatives.
Western Pearlshell Mussell	MIIH	MIIH	Post-fire effects are less detectable on the Selway and Middle Fork Clearwater Rivers. Given location of occupied habitat on the Selway and Middle Fork Clearwater River, proposed project activities with design criteria, BMPs and logging system methods and location of temp road construction would have negligible direct or indirect effects to WPM under all proposed Alternatives.

3.19 Rare Plants

Discussion of cumulative effects for rare plants is addressed through the general trend of the suitable habitat required by these species as a result of past, present and future management actions.

Geographic Boundary: The cumulative effects boundary includes all lands within the project area. The rationale for this is that the effects are site specific to treatment areas and would not extend beyond the boundaries, and effects from outside the defined area would likewise not affect the resource within.

Time Frame: It is not possible to quantify effects of specific activities that are several years or decades old. The status and occurrence of sensitive and rare plants was completely unknown for much of the management history of the watershed. The historic changes in condition and abundance of specific habitats are also largely unknown. Therefore, the effects of these past projects can only be qualified through general discussions.

Past, Present and Foreseeable Future Actions: Past and present timber harvest, grazing, road construction, exotic plant treatment, wildfire suppression and prescribed fire have influenced rare plants in the project area.

Timber harvest began in the 1960s and averaged approximately 3,900 acres per decade up until 2000 through 2009 when only 1,400 acres were harvested, primarily through implementation of the Middle Fork Timber Sale. In addition, advancement in harvest operations, logging technology, best management practices, including retention of PACFISH buffers has significantly reduced timber harvest resource impacts. Road decommissioning started in the 1990s and has increased ever since. All of the past regeneration harvests have been regenerated and roads within the project area constructed to support past timber sales are generally well located on the upper third of slopes or on ridge tops and most of these roads are graveled to reduce sediment. Past timber harvest and associated road construction are considered part of the existing condition.

Grazing is occurring in the proposed project area however it is relatively small in scale and consists primarily of transitional range and there are currently no issues in regard to riparian impacts associated with grazing. There is very little if any effect from livestock grazing within the late successional, closed canopy habitats because of access and lack of desirable forage. An Adaptive Management Environmental Impact Statement is currently being developed for this allotment as part of a larger landscape assessment of grazing that includes 15 grazing allotments covering 350,000 acres. A decision is expected in 2016 or 2017. Past and current grazing impacts are considered as part of the existing condition.

Prior to the Johnson Bar Fire of 2014, the largest wildfires burned 27,250 acres between 1870 and the 1931 fire, which burned approximately 11,000 acres, primarily within the Clear Creek Roadless Area. Approximately 150 acres have burned since then up until 2014 because of the emphasis on fire suppression. All past wild and prescribed fire effects are considered as part of the existing condition.

Noxious weed spraying in the project area has been primarily associated with open roads as they represent the highest weed susceptibility in the project area. Noxious weed control or containment has primarily occurred during the past two decades and has generally consisted of spot spraying targeting specific noxious weeds including the common weeds of thistle, hounds tongue and knapweed. Noxious weed management would continue into the future focusing on high susceptibility areas under current Forest direction. Past noxious weed treatment are considered part of the existing condition.

Some activities such as trail maintenance, road maintenance, recreation site maintenance, access management, and others are considered routine and ongoing and collectively would have negligible impacts on species or habitats of concern.

3.19.1 Alternative 1

Alternative 1 would produce no additional effects on potential rare plant habitat as compared to past activity levels. The progression of forest succession would improve habitat for most sensitive plant species. However, the decline of successional tree species due to insect-caused mortality may cause localized openings and increases in light and fuel loads, which could lead to more intense wildfires and damage to rare plants.

3.19.2 Alternatives 2, 3, and 4

Approximately 25% of the project area has been affected by timber harvest activities in the past sixty years. Proposed Activities under the action alternatives would temporally affect between 5% and 10% of the potential habitat for several sensitive plant species. Alternatives 2, 3, and 4 add short-term disturbance associated with harvest and temporary road construction to approximately five to ten percent of the landscape which has not previously been harvested. Retention of PACFISH buffers and all verified and un-verified old growth would continue to provide critical potential habitat for sensitive plant species. The proposed activities under the action alternatives along with ongoing and reasonably foreseeable future management activities would result in only a slight decrease in potentially suitable sensitive plant habitat. Long-term trends would be static a slight downward trend in habitat quality would not lead to concerns for population viability since these habitats are common across the project area.

3.19.3 Irreversible or Irretrievable Effects

None of the alternatives would implement actions or activities that would result in an irreversible commitment of resources as related to sensitive plants

3.20 Recreation and Trails

3.20.1 Alternative 1

Cumulative effects would be similar to the direct and indirect effects.

3.20.2 Alternatives 2, 3, and 4

The following cumulative effects are common to Alternatives 2, 3, and 4.

The primary contributor to cumulative effects for Recreation and Trail resources is road decommissioning and its effect on recreation opportunities. The road decommissioning associated with Johnson Bar would be on roads currently closed to motorized uses. The effects would result in lost opportunities for non-motorized users, such as hikers, bikers and horseback riders that use these routes. The Clear Creek Restoration Project located to the west would decommission 13.2 miles of road. Approximately 1.6 miles were open to some level of motorized use and the remainder was closed to motorized uses. These changes in available road miles for motorized and non-motorized uses would result in cumulative reductions in road-based recreation opportunities.

3.21 Soils

For the purpose of the project, proposed harvest units and associated temporary roads and prescribed burn units are considered Activity Areas. The cumulative effects areas are the same as those discussed in the section addressing direct and indirect effects.

Areas affected by DSD can take several decades to recover, depending on soil texture, depth of compaction, and loss of organic material (Powers et al. 2005; Froehlich et al. 1983). This analysis considers all activities from the 1950s to the present, as well as 20–50 years into the future.

Conditions in the project area are a result of both natural processes and human activities. Potential DSD within the analysis area could be attributed to fires (notably the Johnson Bar fire) or other past, present, or future management activities including timber sales, thinning projects, dispersed recreation sites, and grazing activities. Ongoing and upcoming projects within the activity areas include forest restoration, firewood cutting, invasive weed control, and road maintenance. Recent and future restoration projects in the analysis area include BAER treatments and fire suppression rehabilitation for the Johnson Bar fire. Although there are numerous projects, disturbances, and semi-permanent features within the analysis area, the Johnson Bar fire is the largest factor that could affect DSD and erosion within the analysis area. For more detailed analysis of erosion and sedimentation risk see the Hydrology Specialist report.

Timber Harvest—Harvesting methods prior to the 1990s often consisted of hand felling trees, unrestricted tractor skidding and extensive machine piling of slash. Ground-based logging occurred on slopes exceeding 35% and dense networks of excavated roads and skid trails were commonly constructed. These practices frequently resulted in extensive compaction, rutting, and areas of scraped or displaced topsoil and organic matter. Machine piling of slash often removed small organic material, large coarse wood, and topsoil. Forest practices have changed over the last few decades. Project design measures, BMPs, and Forest Plan guidelines have been developed in order to reduce the extent of disturbance and maintain soil productivity. Designated skid trails, retention of woody material, operating under dry conditions, and limiting ground-based skidding activities to slopes less than 35% are now common practices. Slash treatment techniques have changed from dozer piling to excavator piling along designated trails, so that less soil displacement and compaction occurs, reducing the detrimental effects to soil.

Since the 1950s, 22% of the project area has been harvested. Most harvest activities occurred between the 1960s and 1990s, with approximately 5,869 acres of intermediate and regeneration harvest. The most notable effects from harvest activities were compaction, displacement, and burned areas at landings. In steeper units, impacts were more dispersed. Less steep units had linear disturbance, mostly in the form of compacted skid trails and landings.

Fire - Approximately 18,236 acres (68% of the project area) have burned in the project area between 1870 and 2013. Evidence of past wildfire was noted in many of the units during soil surveys. No impacts from fire suppression activities were observed.

The Johnson Bar fire burned about 13,000 acres inside the project area. About 527 acres are classified at high burn severity, almost 6000 acres as moderate burn severity, almost 6000 acres as low burn severity and the remainder was unburned or unclassified. High and moderate burn severity areas have 50 to 100 percent bare soil exposed, much of it with reduced capacity for water infiltration.

Roads - Roads also influence soil, with long-term to permanent impairment of soil productivity. Although system roads are excluded in the determination of whether projects meet Forest Plan and Regional standards, these roads are part of the existing condition. Within the project area, approximately 59 miles or 360 acres of system roads occur where topsoil and subsoil have been displaced, mixed, or lost to erosion. This acreage represents about 1% of the project area.

Grazing - Effects from grazing are moderate and tend to be highest near meadow areas, seeps, and springs. Impacts within the units are transitory (in the form of livestock trails) and are mostly on the edges of units or along old skid roads.

Recreation - Recreation activities that were noted during field surveys include dispersed camping, off-highway vehicles (OHVs) and full-size vehicle use, fuelwood cutting, and hunting. Dispersed camping is generally located on already disturbed sites along system roads. Effects from recreation activities are primarily associated with full-size vehicles and OHVs using system roads during wet conditions, creating wheel ruts that concentrate water flow. Disturbance from recreation activities within harvest and burn units is anticipated to be negligible (less than one percent).

Ongoing and foreseeable actions within the proposed Activity Areas (harvest and burn units) consist of grazing, recreation, and fire suppression. Grazing impacts could increase over a period of up to 10-20 years after harvest when more forage is available in the harvest units. This is not expected to account for increased disturbance as livestock would trail along already disturbed skid trails and temporary roads that have been seeded. Recreation activities are not expected to increase in the harvest units, so an increase in detrimental disturbance is not expected. Fuelwood cutting could increase after project activities, but many of the units are located along closed roads and access is limited. Fire suppression activities could increase DSD but the timing and extent of such disturbances cannot be predicted.

3.21.1 Alternative 1

This alternative would maintain the existing condition. It would not alter the current soil erosion or landslide potential and would retain the same amount of coarse woody material, both standing and down. Existing DSD would persist with very slight natural recovery of surface layers of compacted soils.

3.21.2 Alternative 2, 3, and 4

The cumulative effects of these Action Alternatives were based on the estimated potential of increased detrimental disturbance (based on Region 1 Supplement definitions) when added to existing disturbance and to evaluate whether the project met Regional and Forest Plan standards.

The cumulative effect of past and proposed activities was determined by adding the estimated disturbance from the project (increase of 2%–8%) to the existing DSD (0%–6%). Potential cumulative DSD within the harvest units is estimated to be between 2% and 14% prior to implementation of project design measures. (See project file for detailed information on individual units.)

All units would meet Regional soil standards without specialized design measures. Design criteria were created though, to limit the amount of increased DSD from project activities and reduce the amount of existing detrimental disturbance by obliterating existing skid trails and landings. The project would meet the Regional soil standards by limiting the extent of detrimental disturbance to <15% following project implementation.

3.21.3 Irreversible and Irretrievable Commitment of Resources

Loss of the volcanic ash–influenced loess through erosion or removal (excavated temporary roads and skid trails) is irretrievable. Remaining soil materials would eventually develop (over a minimum of several decades) but may lack the water- and nutrient-holding properties of volcanic ash.

Small, localized areas would have reduced soil productivity until vegetation becomes reestablished and organic layers rebuild. These areas include temporary roads, skid trails, and landings. Severely burned areas and areas with deep compaction could take decades to recover (Froehlich et al. 1983). Soil improvement activities such as decompacting soils and adding organic matter (woody material) could jump-start this process (Curren *et al*. 2005a, b).

All project activities include BMPs, design features or rehabilitative measures to avoid irreversible and irretrievable commitment of resources on the productive land base. Decommissioning of temporary roads and skid trails, which includes recontouring and recovery of excavated ash cap topsoil, is expected to initiate recovery of soil productivity functions over time, which could be as long as 40-60 years. Additional design measures such as keeping disturbance to less than 15% areal extent, re-use of existing skid trails in units, decompaction of skid trails and landings, and retention of woody debris are intended to avoid loss of the ash cap soil.

3.22 Vegetation

Past harvesting indicates that only 9% of the project area has been harvested. Past harvesting in the Middle Fork River Basin (139,799 acres) has had 12,464 acres or 9% of the middle for drainage treated. The Selway River Basin (1,288,196 acres) has had 4,117 acres or less than 1% of the drainage treated. The additional treatments of the Johnson bar fire salvage project would treat 2,973 acres under Alternative 2, 2,580 acres under Alternative 3, and 2,298 acres under Alternative 4.

Table 3-55: History of Timber Harvest in the Middle Fork of the Clearwater Drainage

Middle Fork Harvest Method	Year							
	1950–1959	1960–1969	1970–1979	1980–1989	1990–1999	2000–2009	2010-2015	Grand Total
Commercial thin	—	—	—	—	—	—	1048	1048
Clear-cut	80	440	906	—	49	101	—	1576
Pre-commercial thin	—	—	—	—	—	31	—	31
Sanitation (salvage)	—	—	286	77	—	539	—	902
Shelterwood and Seed Tree Harvest	—	26	30	—	23	121	—	200
Grand Total	80	466	1222	77	72	792	1048	3,757

Table 3-56: History of the Harvesting in the Selway Drainage

Selway Harvest Method	Year						
	1960–1969	1970–1979	1980–1989	1990–1999	2000–2009	2010-2015	Grand Total
Commercial thin			135		148		283
Clear-cut	325	680	233	937	257		2432
Pre-commercial thin						198	198
Sanitation (salvage)	13	193	164	190	47		607
Private and State 2014-2015 Salvage						247	247
Shelterwood and Seed Tree Harvest			130	46	14		190
Grand Total	338	873	662	1173	466	445	3,957

Past, present, and reasonably foreseeable future treatments favor early seral species. Treatment units would maintain early seral species which promote forests that are resilient to fire, strong winds, and root rots. Young stands in the seedling to sapling stage are unlikely to be attacked mountain pine beetle or Douglas-fir beetle. The cumulative effect of past, present and future treatments are healthier forests on 1% of the Selway river basin and middle fork of the Clearwater River basins. The cumulative effects indicate that more harvesting treatments that promote early seral species are needed.

Cumulative effects of fire followed by logging can be difficult to separate and measure [McIver and Starr 2001(Dumroese, Jurgensen, Abbott, Rice, Tirocke, Farley, and DeHart, 2006)]. Sedimentation from fire is difficult to measure and can vary dramatically depending rain events directly after the fire. Weather, fire intensity, soil moisture at the time of the fire can result in highly variable sediment yields. Forest Service best management practices and timber sale provisions are designed to promote forest health and reduce sediments.

Benefits of logging practices include:

1) Reduction of heavy fuels (Petersen, Dodson and Harrod, 2015).
2) Fuel breaks
3) The planting and sustaining of early seral trees species that are resistant to fire, insects and root rot (Trip Report CFO-TR-08-24, 2008).
4) Maintaining young age classes for early seral dependent wildlife species.
5) Sustaining the socio-economics of rural communities.
6) Age class diversity
7) Lower stocking which increases tree vigor and reduces tree mortality risk from bark beetles.

Natural stands reach the old growth stage of succession as well. Western red cedar naturally occur in moist conditions, which are resistant to wildfires. Cedar stands may grow to reach old growth conditions; however, high stand densities and ladder fuels encourage stand replacement fires. Currently a majority of stands in the Johnson Bar area are likely to be less than 100 years old.

3.23 Visuals

The cumulative effects area is similar to that for the direct and indirect effects, except that it takes into account the whole viewshed, as opposed to focusing on the individual units and surrounding area. The temporal scope of the analysis is limited to the 30 to 35 years following harvest activities. This time period is the length of time openings created by regeneration harvest are likely to be evident given the growing conditions of the area.

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

Openings created by timber harvest activities from past projects are still evident within the area of interest. Although most openings have regenerated, some still appear as distinctive openings with lineal edges. A few well-defined geometrically shaped openings are found along the Swiftwater Road and to the north of Goddard Creek. Smaller and less noticeable openings are still visible along the ridgeline above the Middle Fork of the Clearwater River from viewpoints along U.S. Highway 12. The larger harvest units that are visible in the Swiftwater and Goddard drainages occurred during the late 1980s and early 1990s and now have vigorously growing regeneration in most areas. The smaller units along the Middle Fork were harvested in early 2000 and are more open, but not very evident because of the small size of the openings. It is anticipated that these openings would no longer be evident within the next 10 to 15 years. Other management activities such as pre-commercial thinning, commercial thinning, salvage logging, road construction, and road maintenance have not had a significant visual impact on the viewsheds within the area of interest and therefor have not had a long term effect.

Present and foreseeable management projects that may affect scenic quality include: Clear Creek Burn, Tinker Bug Timber Sale, Wooden Rat Timber Sale, Clear Creek Restoration, Lowell WUI, Horse Creek, and three prescribed burns – Fenn Face, North Selway, and West Meadow. All these project have been or would be designed to meet the VQOs designated for its particular areas of interest. While none of the harvest units from this project are immediately adjacent to units proposed in this project, there are some within a mile of the Johnson Bar Fire Salvage Project. The visual impact of the harvest proposed in these projects on the Johnson Bar Fire Salvage area of interest would be minor due to the design measures that would be developed for the roads and trails within the Middle Fork of the Clearwater and Selway River areas. The size and shape of the openings within the listed projects would be design to reflect the existing landscape character. There would therefore be no impact on the visual condition of the viewshed from these present and foreseeable future projects.

Other past, present and future activities including tree planting, public use, road reconstruction and maintenance, trail construction and maintenance, precommercial timber stand improvements, and private land activities would have no significant effect on the visual condition of the area of interest because they do not create large enough man-made openings to alter the inherent landscape character to the degree that it would become a dominate visual element within the viewshed.

3.23.1 Alternative 1

There would be no man-made change in the scenic quality of the area of interest in Alternative 1 in the short term, but the evidence of wildfire would increase with time as more trees succumb to the effects of the 2014 fire. The existing man-made openings would continue to re-vegetate and within 10 to 15 years would no longer appear as distinctly as openings, while the fire affected areas would begin to collapse and new openings created from the fire would be evident. Alternative 1 would not change the existing landscape character of the geographic area encompassed within the Johnson Bar Fire Salvage area of interest.

The effect on the scenic resource in alternative 1 in the long and short term would be that of the changes related to a natural fire event. These changes would include creation of large and small openings where the fire burned hot enough to kill the trees. The natural openings currently found in the area of interest would continue to increase in size and number as more areas collapsed due to the effects of the 2014 fire. The younger stands within existing harvested areas would continue to regenerate, with the man-made harvest areas no longer appearing as openings within 10 to 15 years.

3.23.2 Alternative 2

Past harvest activities are visible throughout the area of interest and are viewed from U.S. Highway 12, the Selway River road, the Swiftwater road and associated recreation and residential sites. Most proposed units within the Johnson Bar Fire Salvage Project would be also be visible to some extent from the road, trails and recreation sites within the area of interest, but the impact would be within the visual quality guidelines. Openings would be visible but would reflect the size and shape of natural fire activity, since only dead and dying from the 2014 fire would be removed. In critical viewshed more stand structure would be retained and logging activities such as skyline logging pathways would be minimize. Given the aspect and growing history of the area, the openings created by this proposal would no long appear as openings within 30 to 35 years, but should appear as an area that has experienced the natural process of wildfire rather than man-made, geometric openings that are evident today.

3.23.3 Alternative 3

The cumulative effects of Alternative 3 would be the same as Alternative 2 with the exception of the reduction of harvest activity within the foreground viewing area of the Selway Road (Unit 116) and the use of approximately 10% more helicopter harvesting methods rather than skyline yarding.

3.23.4 Alternative 4

The cumulative effects of Alternative 4 would be the similar to Alternative 2 and 3 in a the Swiftwater road area and the Elk City Creek and Goddard Creek drainages. There would be significant changes in the U. S. Highway 12 corridor and the Selway corridor with the elimination of the units within the foreground viewing area (*Retention* VQO). Alternative 4 would also use more skyline harvest methods, which may be more evident from viewing corridors.

3.24 Weeds

The No Action alternative would continue some ground disturbing activities common to all Alternatives. Weeds would continue to invade and spread across the landscape. The cumulative effect of these activities combined with ongoing human and natural disturbances create the existing rate of weed spread. Additionally, the level of weed colonization currently observed would be expected under the No Action Alternative 1.

Activities proposed under the Action Alternatives 2, 3, and 4, when combined with ongoing disturbances associated with livestock grazing, recreation use, and road maintenance have the potential to increase the rate of noxious weed spread more so than the No Action Alternative 1.

Past and present disturbances associated with vegetation treatments added to reasonably foreseeable actions would create a cumulative effect on weed expansion by the combination of distribution of weed seed, ground disturbance, and creation of spread vectors. The degree of the cumulative effect would vary depending upon the number of entrances over time, distribution of disturbance across the analysis area and acres disturbed. The impacts of cumulative effects incurred by the Action Alternatives 2, 3, and 4 to the risk of weed expansion would be eased with the implementation of the design criteria.

With increased disturbance within and outside of the analysis area, opportunities for the spread of new invaders increase. As vehicles, equipment, animals and humans move through the landscape, each has the potential to carry weed seed to new and currently uninfested areas. This spread really has no limit other than the susceptibility of receiving habitats. Though proposed activities from this project would increase overall weed risk for a short time, habitat readily available for weed invasion in the long term should decline due to overall trends in habitat management, increase in landscape restoration, advancement of succession and progressive weed management.

Effects from past actions are represented within the existing condition. Reasonably foreseeable activities include:

- Proposed Clear Creek Integrated Restoration Project (2016 and beyond)
- Proposed Eastside Grazing Allotment (2016/2017)

3.25 Wild and Scenic Rivers

Very few of the projects listed in Table 3-51 (Past, Present and Reasonably Foreseeable Future Projects) have occurred in the designated Wild and Scenic River Corridor. Ongoing road and trail maintenance, the presence and operation of campgrounds and administrative sites all occur within the corridor. Other projects that have occurred within the corridor and adjacent to the project area include Bridge Creek Timber Sale (2009), Interface Fuels Timber Sale (2012), and the transport of oversized loads on US Highway 12. Bridge Creek and Interface Fuels projects conducted timber harvest and used Wild Goose and Two Shadows helicopter landings. Both projects implemented design criteria to protect river resources, and did so successfully. Future projects with potential activities within the corridor include Lowell WUI, Fenn Face, and North Selway Face. These future projects also include design criteria for protecting river resources.

While direct effects to river resources have been minimized with design criteria, there has been a cadence of short-term activities occurring in the corridor that could be perceived as industrial intrusion within the otherwise pastoral environment, particularly the use of helicopter landings and the transport of oversized loads on US Highway 12. Vegetation treatments have been minor, well less than 1% of the river corridor in the past decade. Decreased forest health and increased insects and disease are evident that may warrant future management action.

3.26 Wildlife

Recent or foreseeable activities adjacent to Forest Service lands include those by private interests and the state of Idaho. A private land owner salvaged 80 acres of his land in 2014.The state plans to salvage about 170 acres of their land in 2015. These operations would create disturbance to terrestrial wildlife in or near the affected units. Some of the wildlife may have been displaced to areas on the national forest. It is expected that these projects on adjacent lands would be finished before any proposed activities by the Forest Service begins.

Fire suppression is the foreseeable management action that would occur in the project area that could affect species habitats. It is the only foreseeable action considered in the cumulative effects analysis for all species. Cumulative effects would vary among the analyzed species, as each has needs for various stages of vegetative growth and structure. Generally, short-term effects vary by species, and long-term effects would range up to 150 years: the time span for a tree seedling to grow to a mature or old growth status. All past activities are considered as part of the existing condition, and present activities on private and state lands are occurring. The state’s activities would be evaluated by the Idaho’s guidelines for analysis on wildlife that may occur in their project area. Logging operations on private lands must abide by the Idaho State Forest Practices Act. Due to the lack of information on present or foreseeable activities, the cumulative effects of fire suppression to the analyzed animals in this report would be immeasurable.

3.26.1 Region 1 Sensitive Species

3.26.1.1 Bald Eagle

3.26.1.1.1 Alternative 1

Alternative 1 would have ***no impact*** on bald eagles or their habitat.

3.26.1.1.2 Alternatives 2, 3, and 4

Alternatives 2, 3, and 4 would generate disturbance (noise) from the proposed activities of timber harvest. Alternative 2 would harvest approximately 10% of potential eagle habitat, while Alternative 3 would affect about 8% and Alternative 4 would impact about 6%. Alternative 4 has no helicopter landing sites proposed along the rivers. Alternatives 2 and 3 propose 3 such sites. Helicopter operations involving these landings along the rivers include flight paths and aerial traffic that may disturb and flush bald eagles from perch and foraging areas that lie in, or are adjacent to the activities. Foraging eagles that are disturbed by aerial operations would re-locate their presence to areas not affected by such. Upon completion of the harvest activities occurring along the rivers, eagles would resume using the areas that they were temporarily displaced from. The effects of the fire salvage project from Alternatives 2, 3 and 4 ***may impact individuals or habitat,*** but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of bald eagle.

3.26.1.2 Black-backed Woodpecker

3.26.1.2.1 Alternative 1

This alternative would not create cumulative effects, as no activities would occur in the burned area. All moderate and high intensity burned areas would offer potential habitat for the woodpecker to forage and nest in. Alternative 1 would have ***no impact*** on the black-backed woodpecker or its habitat.

3.26.1.2.2 Alternatives 2, 3, and 4

The Johnson Bar fire created potential habitat for the black-backed woodpecker. Literature reviews and the mixed severity conditions in the burned areas lead the wildlife biologist to presume that black-backed woodpeckers would be present in the affected area for the next 1-8 years. High intensity burned areas would offer immediate food sources for beetles coming to the area, which should begin during spring of 2015. Moderately burned areas may continue to create food sources for beetles as trees die from stressed conditions (failing root systems, falling snags that damage bark and structure to living trees and so on). Therefore, these future declining trees would become susceptible to beetle attack, and forage for the black-backed woodpecker.

The action alternatives have potential direct effects (disturbance, fatality, displacement) and indirect affects (species avoidance during periods of project activities) to some individual black-backed woodpeckers. However, the action alternatives would leave over 70% of potential habitat for the woodpecker unaffected by salvage operations. The latter habitat would provide forage, nesting and areas for displaced woodpeckers.

The effects of the fire salvage project ***may impact individuals or habitat,*** but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the black-backed woodpecker.

3.26.1.3 Fisher

3.26.1.3.1 Alternative 1

No direct or indirect effects are anticipated with this alternative. Outside of future wildfires and fire suppression activities, no other cumulative effects are expected. Recovery of potential fisher habitat in burned areas is expected to occur in 30-40 years. Therefore, this alternative would have ***no impact*** on the fisher.

3.26.1.3.2 Alternatives 2, 3, and 4

The fire affected about 31% of potential fisher habitat. Of the 13,950 remaining acres (unburned or low severity) the action alternatives would reduce potential habitat in Alternatives 2 and 3 by 10%, and Alternative 4 by 8%. Upon completion of project activities, vegetation would regenerate and small mammals would increase to forage on new vegetation, seeds and other invertebrates. As time passes, shrubs and trees would produce cover over bare ground and create better habitats for rabbits, hares, squirrels and grouse. The spike in the prey base for the fisher would last from 5 to 30 years. Snags and large trees surviving the fires and harvest operations would be available as nesting or resting habitat. As mentioned, burned or harvested areas would become potential fisher habitat in 30-40 years after disturbance.

The effects of the fire salvage project ***may impact individuals or habitat,*** but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the fisher.

3.26.1.4 Flammulated Owl

3.26.1.4.1 Alternative 1

No activities are planned in this alternative, so no direct, indirect or cumulative effects would occur. Over time vegetation would recover in burned areas, providing food for insects that flammulated owls prey on. Unburned or surviving, older ponderosa pines would provide potential nesting habitat. Pines regenerating from the fire would become potential nesting habitat in about 80 to 100 years. This alternative would have ***no impact*** on the flammulated owl.

3.26.1.4.2 Alternatives 2, 3, and 4

The action alternatives would affect between 12-16% of potential flammulated owl habitat. Upon completion of the salvage harvest, forage habitat would occur in 1-5 years and produce forage for another 10 to 15 years. Forest openings caused by insect and disease damage or future fires would augment forage opportunities for the owl.

Project activities are likely to disturb owls from noise and other human activities. Owls may be displaced to other areas outside of the affected units during the period of harvest activities. Silvicultural prescriptions would retain legacy trees and other large trees, whether they are alive, dying or dead. This would provide some structure for owls that may return to the open areas for foraging on the insects the dead wood or new vegetation that is occurring in post-fire conditions.

Alternatives 2, 3 and 4 ***may impact individuals or habitat,*** but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the flammulated owl.

3.26.1.5 Bats: Fringed Myotis, Long-eared Myotis, and Long-legged Myotis

3.26.1.5.1 Alternative 1

No activities are proposed with this alternative; therefore no cumulative effects would occur. Natural events (wind, fire, insect and disease) would create snags or drop them. Wood cutting would remove snags along roads with public motorized access. This alternative would have ***no impact*** on the analyzed bat species.

3.26.1.5.2 Alternatives 2, 3, and 4

Alternative 2 would affect about 11% of the modelled habitat for the fringed myotis. Alternative 3 would affect about 6% and Alternative 4 would affect about 8%.

Alternative 2 would affect about 7% of the modelled habitat for the long-eared and long-legged myotis. Alternatives 3 and 4 would affect about 6%. Design measures for the harvested stands would retain all live trees and large snags that would offer potential roosting or foraging opportunities for the myotis species. Old growth and all riparian areas would not be affected. Disturbance impacts may create direct (displacement, harm or fatality) or indirect affects (movement from roost to avoid noise) to bats in the affected areas. Cumulative effects would extend to 100-120 years, as this is the period it would take to develop a new generation of large trees or snags with the bark component favorable for bats. The action alternatives ***may impact individuals or habitat***, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the analyzed myotis bats.

3.26.1.6 Gray Wolf

3.26.1.6.1 Alternative 1

No activities are proposed with this alternative; therefore no cumulative effects would occur. As areas burned by the fire recover, foraging habitat for big game would continue to increase, thereby increasing prey availability for wolves. Additionally, road densities would remain low in the burned areas, would benefit big-game and wolves. Alternative 1 would have ***no impact*** on wolves.

3.26.1.6.2 Alternatives 2, 3, and 4

The action alternatives may disturb or cause wolves to avoid areas of human presence. All the action alternatives would create forage opportunities for elk and big-game in the span of the next 20 years after project activities are completed. An increase in prey quantity and availability would attract wolves into the analysis area.

The cumulative effects for changes in wolf prey would be about 5-30 years. In this timeframe forage would be at peak availability, then decline as the tree overstory begins to shade out the understory. Increasing hiding cover would decrease a wolf's visual detection of elk and big game in the area. Decommissioned road prisms would produce vegetation that would offer forage or cover for big game. Elk security would return to the present existing conditions; then increase as forage becomes better represented in the project area. Wolves would continue to be managed until elk numbers reach desired conditions by the state.

Wildfires would continue to create disturbance and produce forage in the next 20 years after such events. Fire suppression would reduce the amount of forage created by wildfires. The management for increasing elk numbers includes increased habitat and improvement of forage. The action alternatives would assist in the production of forage for elk and other big-game.

Current numbers of wolves and packs are above the desired levels of management for the viability of the population. They are distributed throughout the combined forest. All of the action alternatives ***may impact individuals or habitat***, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the gray wolf.

3.26.2 Management Indicator Species (MIS)

3.26.2.1 American Marten

3.26.2.1.1 Alternative 1

No activities are proposed in this alternative, so no direct, indirect or cumulative effects are expected. Firewood cutting along roads open to public motorized access would continue to remove snags along or near the road prisms. Fire suppression would continue in response to wildfires. Such operations may save portions of marten habitat. Activities may disturb or temporarily cause the marten to re-locate to other areas where prey is available, or where the animal perceives it is safe from disturbance. In 130 or more years, tree stands in the burned area would have developed into mature age class that would provide structure and snags preferred by the marten.

3.26.2.1.2 Alternatives 2, 3, and 4

The action alternatives would impact modelled marten habitat by 6% in Alternatives 2 and 3, and 5% in Alternative 4. Project activities would create noise and activities that may disturb an individual marten. Direct and indirect effects may displace a marten from its nest or foraging areas within or adjacent to a harvest unit.

All harvested units would be replanted with trees. Vegetation recovery in units would begin providing habitat for small mammals in 3-5 years. In approximately 40 years the tree structure would be favorable for martens. As the replanted stands mature, tree diameter sizes and canopy cover would trend towards desired conditions for the marten.

The cumulative risk to marten habitat is considered low due to the retention of old growth and other mature trees, riparian areas, and live trees and snags left in harvested areas. Downed woody debris would continue to accumulate as trees age and die. Similar to Alternative 1, cumulative effects of fire suppression and time period of tree maturation to preferred marten habitat would occur. Under Alternatives 2, 3, and 4 *some impacts may occur to individuals or their habitat, but is not expected to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing of the American marten.*

3.26.2.2 Northern Goshawk

3.26.2.2.1 Alternative 1

The cumulative effect area is the 26,000+ acre project area which includes six old growth analysis areas. The cumulative effects timeframe is 150 years as it would take this long for regeneration harvest areas to develop old growth habitat. Natural disturbances of wildfire, insect and disease or even wind or avalanche events may transition nesting habitat to an earlier successional stage that may or may not be foraging habitat for some years. This alternative has no direct, indirect or cumulative effects on the northern goshawk.

Future availability of habitat is difficult to predict. The recent fire event reduced habitat quality and quantity such that goshawks may not use the affected area. This effect would last until burned areas regenerate and grow to favorable conditions for foraging habitat (10 years and longer), and about 100 to 150 years for nesting habitat. In the absence of large, stand replacing fire or large outbreaks of insects/disease, nesting habitat would increase as the quantity of mature and old growth habitat increases. Connectivity would continue to be provided by riparian habitat conservation areas.

3.26.2.2.2 Alternatives 2, 3, and 4

Nesting habitat would be reduced by the action alternatives in a range of 5 to 7% in the project area. The alternatives' impacts on foraging habitat would be between 5 to 7%. Harvest activities would improve growing conditions for grasses, forbs, and shrubs. Re-planting native tree species would provide future nesting habitat conditions for the goshawk in roughly 150 years.

Natural events may occur in the future as mentioned under Alternative 1. No measurable effects to goshawk populations at the local or regional scale, or alteration of current population trend, are expected from the cumulative effects of any of the action alternatives, or in combination with future activities, based on the availability of unaffected suitable habitats in the analysis area and across the Forest and region. Under Alternatives 2, 3, and 4, *some impacts may occur to individuals or their habitat, but is not expected to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing of the northern goshawk.*

3.26.2.3 Pileated Woodpecker

3.26.2.3.1 Alternative 1

Alternative 1 would not generate any cumulative effects, as no activities are proposed.

The cumulative effect area is the approximate 27,000-acre Johnson Bar Fire Salvage project area which includes six old growth analysis areas. The fire burned about 950 acres of old growth leaving approximately 2,800 acres of the age class in the PA. No old growth would be harvested by any of the action alternatives.

The cumulative effects timeframe is 100-150 years, as it would take this long for regeneration harvest areas to develop into large tree or old growth habitat. Timber harvest may contribute to short-term habitat fragmentation until harvested stands reach later stages of succession. Problems associated with forest fragmentation include weather-related effects and loss of forest interior habitat, loss of habitat connectivity, and increased vulnerability to predators (Finch 1991). The action alternatives would not disrupt habitat connectivity for pileated woodpeckers. Riparian areas would not be affected and old growth would be maintained. Both areas would provide nesting and foraging habitat.

3.26.2.3.2 Alternatives 2, 3, and 4

Some disturbance to woodpeckers would occur during the implementation of any of the action alternatives. Under Alternatives 2, 3, and 4, some impacts may occur to individuals or their habitat, but is not expected to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing of the pileated woodpecker.

3.26.2.4 Rocky Mountain Elk

3.26.2.4.1 Alternative 1

This alternative would not create direct, indirect or cumulative effects, as no activities are proposed. Big game forage would remain low throughout the analysis area until vegetation begins to recover. Livestock grazing would continue. Future wildfires would create forage over time. Fire suppression would continue, which would limit the amount of forage the wildfires would create if unattended. The state would continue trapping wolves and managing other predators of elk.

3.26.2.4.2 Alternatives 2, 3, and 4

Temporary roads would be built in these alternatives and would remain closed to public access. The project activities would disturb elk during the period of implementation. Elk would move away from these areas, but may return during hours of darkness to forage on the lichens or younger leaves on the felled trees. Upon completion of the timber sales, all temporary roads would be decommissioned. Security areas would increase in response to the road closures in the EAAs.

All action alternatives would improve about 10-16% of existing winter range. Another 5% of general elk habitat in other MAs outside of winter range would be improved from harvest activities. All treated units would improve at a faster rate than areas unaffected by timber activities, as all units would be planted with tree species found on the forest. In 5-10 years tree stands would be evident in the treated areas, whereas, the untreated areas may just be producing an understory of grass, herbs and shrubs. The planted areas would provide hiding cover in about 15 years post-harvest. About this time a mosaic of openings and developing forest conditions would provide an increase in EHE levels and the acreage available as security areas. The effects of livestock grazing, wildfires, fire suppression and predator management would be similar to Alternative 1.

3.26.2.5 Shiras Moose

3.26.2.5.1 Alternative 1

There would be no direct or indirect effects from this alternative; therefore, there are no cumulative effects. Areas of MA 21 that were affected by the fire would recover to mature or old growth potential in 130 to 150 years, if no further disturbances occurred. The burned areas outside of MA 21 would provide shrub forage in about 5-10 years post-fire, depending on the burn severity of the affected areas. This forage would be summer forage. As the trees grow and multi-layered canopies develop, the shrub and understory component would decline.

Disturbance factors such as fire, insect and disease, wind events, and so on, would create openings where the cycle of forest succession would begin anew. These openings would generate forage for moose as they occur.

3.26.2.5.2 Alternatives 2, 3, and 4

All of the action alternatives would affect about 1% of moose winter range (MA 21). The direct effects of disturbance have been discussed. Indirect effects may be increase pressure on moose from wolves and other predators, due to the reduction of canopy and hiding cover from fire and salvage harvest.

None of these alternatives would harvest old growth or in riparian areas. All harvested units would be re-planted with native species to the forest. Besides the planted trees, natural vegetation response to the areas affected by harvest and fire would be similar to what was described in Alternative 1. The same applies to the disturbance factors mentioned in Alternative 1. Under Alternatives 2, 3, and 4, some impacts may occur to individuals or their habitat, but is not expected to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing of the Shiras moose.

3.26.2.6 Neotropical Migratory Birds

3.26.2.6.1 Alternative 1

There would be no direct or indirect effects to neotropical migrants from this alternative; therefore, there are no cumulative effects. Current population trends would be unaffected. Wildfires may create openings for up to 30 years, depending on how hot the fire burned. These openings would produce shrubs, grass and forbs for about 15 to 20 years. This stage of vegetation growth would offer birds some vertical structure for nests and foraging.

Snags near or adjacent to roads that allow public motorized access would be cut for firewood. Any nests in such trees would be lost. Snags occurring in further distances from roads or in remote areas are likely to unaffected by firewood gathering.

3.26.2.6.2 Alternatives 2, 3, and 4

Harvested units would recover from native seed sources in the soil and planted trees. During the first 15 years after timber sale completions, growing shrubs and trees would offer favorable opportunities for nesting songbirds. A greater quantity and diversity of invertebrates would be available during this period, which would benefit bird insectivores.

All temporary roads would be decommissioned. In time, vegetation would fill in the bare ground. Shrubs and trees would provide a vertical structure for nests and foraging.

The short-term effects have been listed above in the direct and indirect effects, and cumulative effects in Alternative 1. Long-term effects up to 150 years would be the recovery period for fire and timber affected areas to produce old growth or mature forested stands. Tree growth (if unaffected by disturbance) would increase the vegetative horizontal and vertical representation in the area, offering increased canopy cover and more diverse structure to the forest. This would benefit all forest-preferring migratory birds. The reduction of road densities would also discourage predation or parasitism of neotropical migrants from species that prefer edge effect habitats: cowbirds, starlings, ravens, and others. The determination for the action alternatives -*some impacts may occur to individuals or their habitat, but is not expected to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.*

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APPENDIX A

Fish Summary Data

Fish Summary Data

Tables 1A-4A. USFS O'Hara Creek Fish Density surveys by year (#/100 m^2)

Table 1A: 1988 Fish Densities

Length Class (in)	*Undiff Trout*	*Steelhead*		*Chinook*		*Rainbow*		*Cutthroat*	*Bull*	*Whitefis h*
		W	*A*	*W*	*A*	*W*	*H*			
<2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	**28.61**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	**5.01**	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	**22.71**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

W= ***Wild & Natural*** A= **Adipose Clipped** H=Hatchery

Table 2A: 1989 Fish Densities

Length Class (in)	*Undiff Trout*	*Steelhead*		*Chinook*		*Rainbow*		*Cutthroat*	*Bull*	*Whitefish*
		W	*A*	*W*	*A*	*W*	*H*			
<2	**3.57**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	**2.62**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	**0.24**	0.00	0.00	0.00	0.00	0.00	**0.24**	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 3A: 1990 Fish Densities

Length Class (in)	Undiff Trout	Steelhead		Chinook		Rainbow		Cutthroat	Bull	Whitefish
		W	A	W	A	W	H			
<2	**4.87**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	**0.85**	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	**4.76**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	**2.33**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	**0.63**	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 4A: 1991 Fish Densities

Length Class (in)	Undiff Trout	Steelhead		Chinook		Rainbow		Cutthroat	Bull	Whitefish
		W	A	W	A	W	H			
<2	**2.22**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	18.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	**11.11**	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	**6.22**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	**5.78**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 5A: Nez Perce Tribe Fall Chinook Spawning Ground Surveys

Length Class (in)	*Undiff Trout*	*Steelhead*		*Chinook*		*Rainbow*		*Cutthroat*	*Bull*	*Whitefish*
		W	*A*	*W*	*A*	*W*	*H*			
<2	0.00	**1.27**	0.00	**0.49**	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	**1.76**	0.00	**2.26**	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	**1.98**	0.00	**2.82**	0.00	0.00	0.00	**0.07**	0.00	0.00
4	0.00	**2.26**	0.00	**4.02**	0.00	0.00	0.00	**0.07**	0.00	0.00
5	0.00	**1.41**	0.00	**0.07**	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	**0.21**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	**0.07**	0.00	0.00	0.00	0.00	0.00	**0.07**	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.07**	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 6A: 2014 Fish Densities

Length Class (in)	*Undiff Trout*	*Steelhead*		*Chinook*		*Rainbow*		*Cutthroat*	*Bull*	*Whitefish*
		W	*A*	*W*	*A*	*W*	*H*			
<2	0.00	**0.00**	0.00	**0.47**	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	**0.00**	0.00	**0.21**	0.00	0.00	0.00	0.42	0.00	0.00
3	0.00	**0.00**	0.00	**0.00**	0.00	0.00	0.00	**0.21**	0.00	0.00
4	0.00	**0.00**	0.00	**0.00**	0.00	0.00	0.00	**0.16**	0.00	0.00
5	0.00	**0.00**	0.00	**0.00**	0.00	0.00	0.00	0.26	0.00	0.00
6	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.05**	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

A 1995 fish survey that found salmonid densities ranging from 4.8 to 10.4 (#/100m^2), 4 transects were surveyed, data can be located in the project record.

Table 7A: Selway 2013 Aerial Fall Chinook Redd Surveys

Rm	RKm	Landmark	New Redds Counted by Flight Date 10/16	10/30	11/18	Total
0.06	0.1	Just above mouth	1	4		5
2.6	4.2	Just below O'Hara Bridge	1		2	3
4.5	7.2	Ranger Station		1		1
15.9	25.7	Below Gedney Cr			1	1
		Totals	2	5	3	10
		River Mile Start	0	0	0	
		River Mile End	31	31	31	
		River Flow USGS Lowell Gauge (m^3s)	25.0	32.3	28.6	
		General Observation Conditions	Excel	Excel	Good	

Table 8A: Middle Fork Clearwater 2013 Aerial Fall Chinook Redd Surveys

Rm	RKm	Landmark	New Redds Counted by Flight Date 10/16	10/30	11/18	Total
2.7	4.3	Just above Clear Creek	2	5		7
3.9	6.2	Just above Maggie's Bend		7		7
7.0	11.2	Above Maggie's Bend			6	6
10.7	17.3	Below Syringa			1	1
11.2	18.0	Houses below Syringa		4		4
12.9	20.8	Below Syringa	1			1
15.4	24.8	Downstream Island end below Syringa	1			1
21.6	36.5	Island just below Selway River	1			1
		Totals	5	16	7	28
		River Mile Start	0	0	0	
		River Mile End	37	37	37	
		River Flow USGS gauges Lochsa and Selway (m^3s)	39.6	31.1	50.3	
		General Observation Conditions	Excel	Excel	Good	

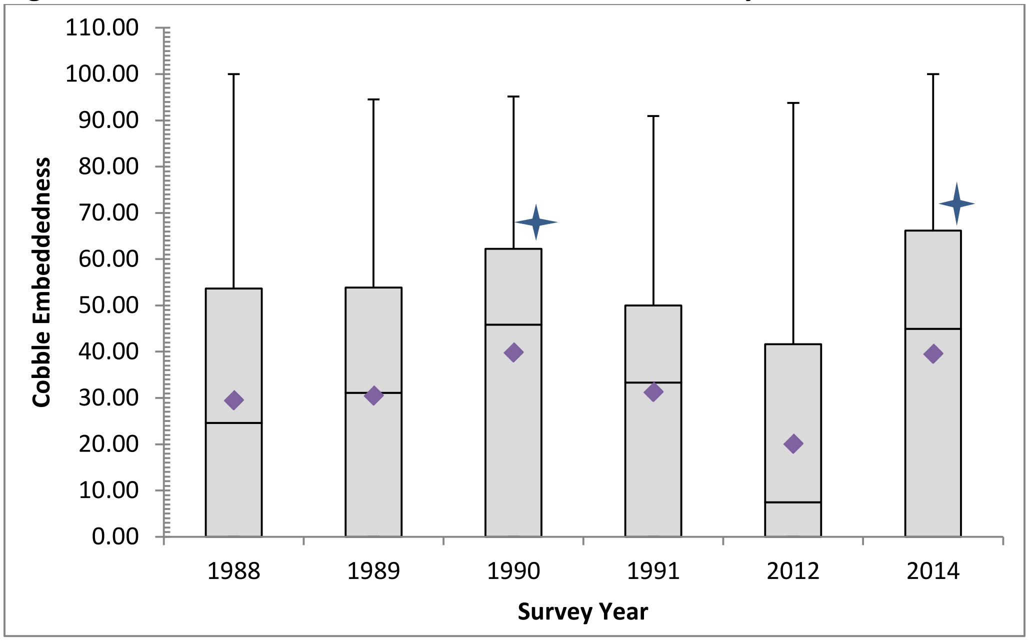
Appendix B

Temperature and Substrate Data

Table B1: Stream temperature monitored in the Analysis Area

Stream Site	Stream Temperature by Year (Seven day maximum average °C)																				
	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Selway at Mouth										23	25		25	26					23	26		23
Selway above FS boundary	19	24						22	22													
Selway above O'Hara Cr.	23	25	20		19		21	24		22		23		25							13	21
Selway above Race Cr.										21	22			24		20					17	20
Swiftwater Creek above FS. Boundary			13				17															
O'Hara Cr.																			19	20		
EF O'Hara Cr.					15					16												

Figure B2: O'Hara Creek cobble embeddedness summary statistics



This box and whisker plot is a display of summary statistics (mean (purple diamond), median, max, min, Q1 and Q3 with SD). The asterisks mark years that were significantly different than the others. Below are the results of the Analysis of Variance (ANOVA), which, detects any significant differences between mean weighted cobble embeddedness. Unfortunately, ANOVA through Excel, does not show where these differences lie so, a separate paired t-test with a Bonferonni adjustment was needed to detect these differences. The ANOVA did detect differences (p=5.64E-12). The paired t-test showed significant differences between the years (88 vs 90, 89 vs 90, 89 vs 2014, 90 vs 91, 90 vs 2012, and 2012 vs 2014), indicating the 1990 survey and 2014 were significantly different than other years. No trend was detected, the mean CE ranges between 10-47%.

Appendix C

NEZSED and FISHSED Results

NEZSED and FISHSED Results

Figures C1 to C8: NEZSED sediment tons/year by alternative (10 years) and prescription watershed. Alternative 2 and 4 have greater sediment yields due to ground based harvest, road improvements and decommissioning efforts reduce sediment yields below existing condition in some watersheds.

Figure C1: Lower O'Hara Creek

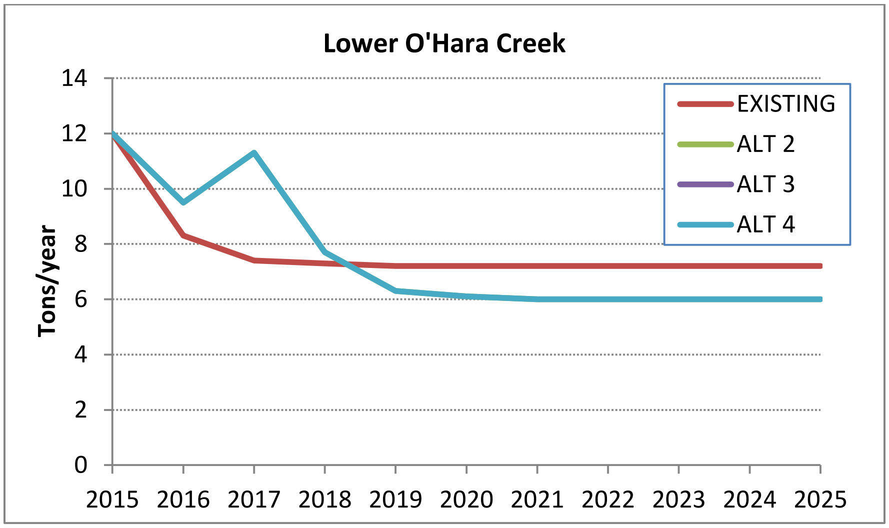


Figure C2: Goddard Creek

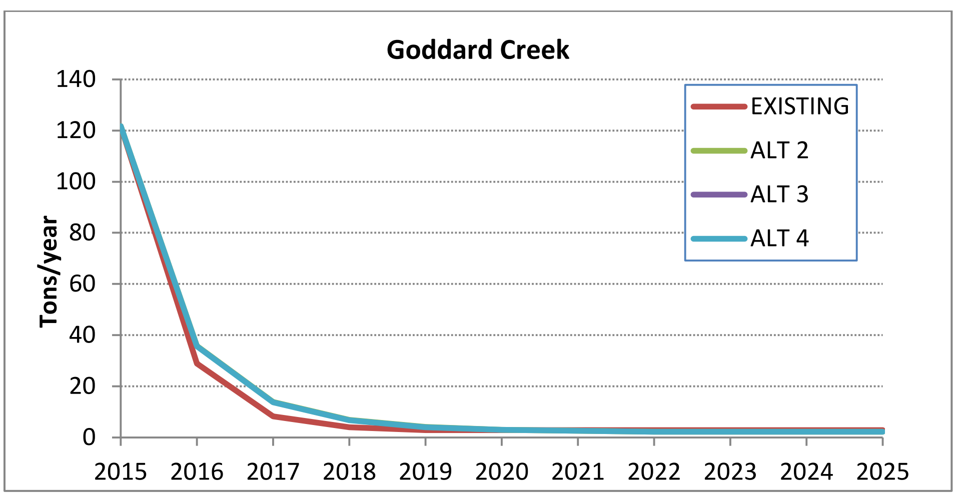


Figure C3: Unnamed No. 8

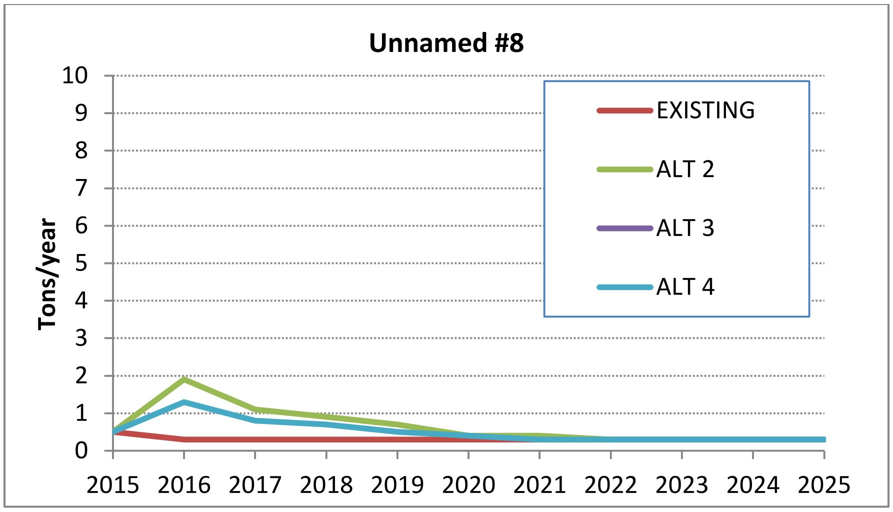


Figure C4: Elk City Creek

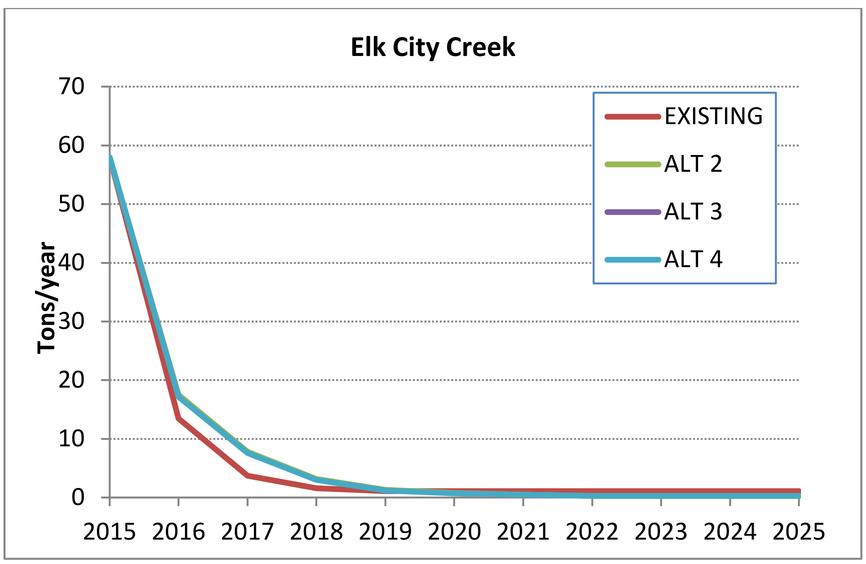


Figure C5: Decker Creek

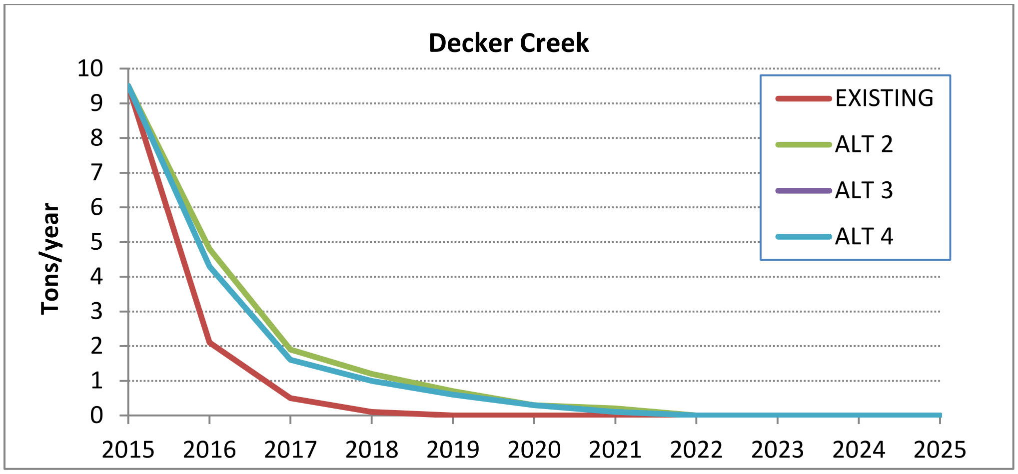


Figure C6: Swiftwater Creek

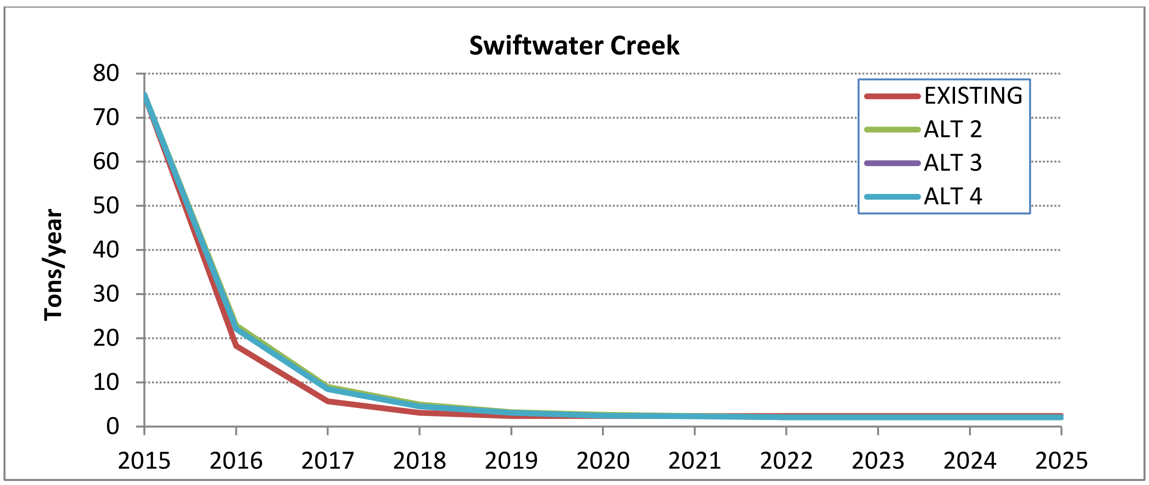


Figure C7: Middle Fork Clearwater Face

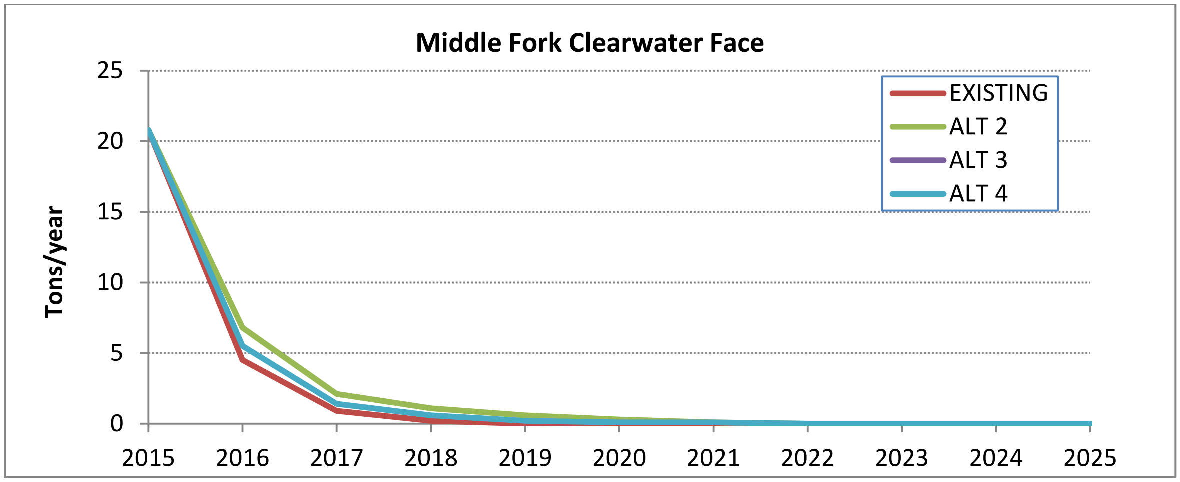
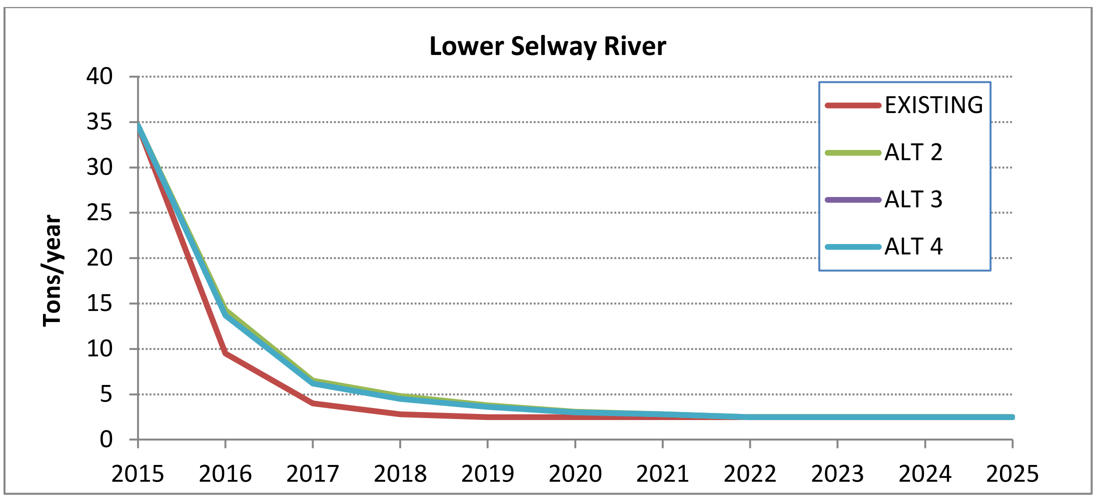


Figure C8: Lower Selway River



FISHSED results are in Tables C1 to C3. FISHSED does not generate trend over year but, only compares between treatments by Alternative.

Table C1: Summary of loss of summer rearing capacity by Alternative

Prescription Watershed	**Pre-Fire Existing Condtion**	**Alt. 1 Existing Condition (Effect of Fire)**	**Alt. 2 (Effects of Fire and Alt.2)**	**Alt 3 (Effects of Fire and Alt. 3)**	**Alt. 4 (Effects of Fire and Alt. 4)**
Lower O'Hara	91	91	91	91	91
Goddard Creek	83	82	82	82	82
Elk City Creek	80	79	78	78	78
Swiftwater Creek	88	88	88	88	88
Lower Selway River	86	86	86	86	86
Lodge Creek	91	91	91	91	91
Unnamed Number 8	86	86	86	86	86
Decker Creek	91	91	91	91	91
Middle Fork Clearwater Face	86	86	86	86	86

Table C2: Summary of loss in winter rearing capacity by Alternative

Prescription Watershed	Pre-Fire Existing Condtion	Alt. 1 Existing Condition (Effect of Fire)	Alt. 2 (Effects of Fire and Alt.2)	Alt 3 (Effects of Fire and Alt. 3)	Alt. 4 (Effects of Fire and Alt. 4)
Lower O'Hara	28	28	28	28	28
Goddard Creek	18	17	17	17	17
Elk City Creek*	15	12	15	15	15
Swiftwater Creek	24	23	23	23	23
Lower Selway River	21	21	21	21	21
Lodge Creek	28	28	28	28	28
Unnamed Number 8	21	21	21	21	21
Decker Creek	28	28	28	28	28
Middle Fork Clearwater Face	21	21	21	21	21

Table C3: Predicted increases in cobble embeddedness by Alternative

Prescription Watershed	Pre-Fire Condition		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	% Over Base	% CE	% Over Base	% CE	% Over Base	% CE	% Over Base	% CE	% Over Base	% CE
Lower O'Hara	1	37	1	37	1	37	1	37	1	37
Goddard	1	51	5	52	7	52	7	52	7	52
Elk City	1	55	15	56	20	57	19	57	19	57
Swiftwater	1	42	9	43	11	43	10	43	11	43
Lower Selway	0	46	1	46	2	46	2	46	2	46
Lodge Creek	1	37	1	37	2	37	2	37	2	37
Unnamed Number 8	0	46	1	46	3	46	3	46	2	46
Decker	0	37	3	37	6	38	6	38	6	38
Middle Fork Clearwater Face	0	46	0	46	0	46	0	46	0	46

Appendix D

Upward Trend Analysis

Upward Trend Analysis for Prescription watersheds that are not currently meeting Fishery Water Quality Objectives and Habitat Potential (NP LRMP Appendix A).

Table 1D: Prescription watersheds summary of Upward trend analysis

Prescription Watershed	Max increase in allowable Sediment Yield	Entry Frequency-# of yrs. in 1 decade sediment yield guidelines can be approached or equaled.	% change in rearing habitat (Action Alternatives		Meeting Upward Trend	Rationale
			Summer	Winter		
Lodge Creek	45	2	0	0	Y	Sediment yield under proposed action alternatives is below allowable and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10%. Proposed 3.0 miles of road decommissioning reduces overall road density.
Goddard Creek	45	2	1-3	6	Y	Sediment yield under proposed action alternatives is below allowable and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10%. Sediment yield under proposed action alternatives is below allowable and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10%. Proposed 5.2 miles of road decommissioning reduces overall road density.
Swiftwater Creek	45	2	0	4	Y	Sediment yield under proposed action alternatives is below allowable and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10%. Sediment yield under proposed action alternatives is below allowable and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10%. Proposed 3.4 miles of road decommissioning reduces overall road density.
Elk City Creek	70	3	1-3	0	Y	Sediment yield under proposed action alternatives is below allowable and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10%. Sediment yield under proposed action alternatives is below allowable and meets entry frequency guidelines. Percent change in rearing capacity does not exceed

Prescription Watershed	Max increase in allowable Sediment Yield	Entry Frequency-# of yrs. in 1	% change in rearing habitat (Action Alternatives		Meeting Upward Trend	Rationale
						10%. Proposed 4.4 miles of road decommissioning reduces overall road density. The removal of Elk City Creek culvert on FS Rd 652 will increase channel stability and improve fish passage.
Lower O'Hara	30	1	0	0	Y	Sediment yield under proposed action alternatives is below allowable and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10%. Sediment yield under proposed action alternatives is below allowable and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10%. Proposed 5.7 miles of road decommissioning reduces overall road density. The 7 culvert replacements and road improvements on the FS 651 Rd will reduce long-term sediment inputs and restore hydrologic processes to lower O'Hara creek. Past instream efforts will continue increase instream habitat complexity.

APPENDIX E

Wildlife

Table W1 lists Nez Perce National Forest TES, sensitive species and management indicator species that may occur in the project area boundary. Additional columns display if suitable habitat is present and/or would be affected in the project area for the associated species. Another column displays if the animal is known to be in the project area, and the determination column shows if the proposed project actions are likely to affect the species or habitat.

Species highlighted in gray are analyzed in detail in the wildlife section of Chapter 3 in the EA. Species non-highlighted were dropped from detailed study if: 1) habitat (and therefore the species) is not present; 2) habitat is protected by regulations, policies, laws, or project design criteria; or 3) no activities are proposed in suitable habitats such that there would be no effect; effects would be improbable; or the effects would be immeasurable.

Table W1 lists the following species: threatened (T), sensitive (S), and management indicator species (MIS) that the Nez Perce portion of the national forest must evaluate for each project. A yes (Y) or no (N) indicates how this project would affect each species.

Species Name	Status	Habitat Present in PA	Habitat Affected	Known Occurance	Determination
Canada Lynx (*Lynx canadensis*)	T	N	N	*N	NE
American Peregrine Falcon (*Falco peregrinus anatum*)	S, MIS	N	N	N	NI
Bald Eagle (*Haliaeetus leucocephalus*)	S, MIS	Y	N	Y	MIIH
Black-backed woodpecker (*Picoides arcticus*)	S	Y	Y	Y	MIIH
Black Swift (*Cypseloides niger*)	S	N	N	N	NI
Common Loon (*Gavia immer*)	S	N	N	N	NI
Coeur d’Alene salamander (*Plethodon idahoensis*)	S	Y	N	Y	NI
Flammulated Owl (*Otus flammeolus*)	S	Y	Y	Y	MIIH
Fisher (*Martes pennant*)	S, MIS	Y	Y	Y	MIIH

Species Name	**Status**	**Habitat Present in PA**	**Habitat Affected**	**Known Occurance**	**Determination**
Fringed Myotis (*Myotis thysanodes*)	S	Y	Y	N	MIIH
Gray Wolf (*Canis lupus*)	S, MIS	Y	Y	Y	MIIH
Harlequin Duck (*Histrionicus histrionicus*)	S	N	N	N	NI
Long-billed curlew (*Numenius americanus*)	S	N	N	N	NI
Long-eared myotis (*Myotis evotis*)	S	Y	Y	Y	MIIH
Long-legged myotis (*Myotis volans*)	S	Y	Y	Y	MIIH
Mountain Quail (*Oreortyx pictus*)	S	N	N	N	NI
North American Wolverine (*Gulo gulo luscus*)	S	Y	N	N	NI
Pygmy Nuthatch (*Sitta pygmaea*)	S	Y	Y	N	NI
Ringneck snake (*Diadophis punctatus*)	S	Y	N	N	NI
Townsend’s big-eared bat (*Corynorhinus townsendii*)	S	N	N	N	NI
Western Toad (*Bufo boreas*)	S	Y	N	N	NI
White-headed woodpecker (*Picoides albolarvatus*)	S	N	N	N	NI
American Marten (*Martes Americana*)	MIS	Y	Y	N	
Bighorn Sheep (*Ovis canandensis*)	S, MIS	N	N	N	NI

Species Name	Status	Habitat Present in PA	Habitat Affected	Known Occurance	Determination
Grizzly Bear (*Ursus arctos horribillis)*	MIS	Y	N	Unknown	currently unoccupied status
Northern Goshawk (*Accipiter gentilis*)	MIS	Y	Y	Y	
Pileated Woodpecker (*Dryocopus pileatus*)	MIS	Y	Y	Y	
Rocky Mountain Elk (*Cervas elaphus*)	MIS	Y	N	Y	
Shiras Moose (*Alces Alces*)	MIS	Y	Y	N	

*- Not seen since 1999. Determinations: NE= no effects; NI= no impacts; MIIH= may impact individuals or their habitats, but not likely to result in a trend to federal listing or a reduced viability for the population or species.

3 SPECIES DROPPED FROM DETAILED ANALYSIS

Not all management indicator species (MIS) and Forest sensitive species or their habitats occur in the analysis area. Species unlikely to be present due to insufficient habitat and/or species unaffected by proposed activities include: Canada lynx, American peregrine falcon, bighorn sheep, black swift, common loon, Coeur d' Alene salamander, grizzly bear, harlequin duck, long-billed curlew, mountain quail, north American wolverine, ring-neck snake, Townsend's big-eared bat and yellow-billed cuckoo. These species will not be considered in detail in this assessment.

Canada Lynx

The project area is not in a lynx analysis area (LAU). No lynx observations or signs have been detected in the project area. The proposed activities for this project would have ***no effect*** on the Canada lynx or its habitat. The lynx was dropped from detailed analysis.

American Peregrine Falcon

This species is a Nez Perce National Forest sensitive species and an Idaho species of greatest conservation need (IDFG 2005). Peregrine falcons nests on ledges on steep cliff faces. No cliff habitat has been identified in the PA. No peregrine falcons have been detected in the project area. The proposed activities would have ***no impact*** on this species and it was dropped from detailed study.

Bighorn Sheep

This species is a Nez Perce National Forest sensitive species and management indicator species and an Idaho species of greatest conservation need (IDFG 2005). There is no suitable habitat or detections of the sheep in the analysis area, therefore the proposed activities would have ***no impact*** on this species and it was dropped from detailed study.

Black Swift

This species is a Nez Perce National Forest sensitive species and an Idaho species of greatest conservation need (IDFG 2005). The black swift is a neotropical migratory bird that nests in moist cliff environments, preferring high elevation mountains. Nests are built on cliff ledges, near or behind waterfalls or in shallow caves. Riparian habitats would be protected by implementing Forest Plan Amendment 20 (PACFISH) and no suitable habitat is known to occur in the project area. Researchers found that most of Idaho's Black Swift observations occurred in the northern panhandle, north of the Lochsa River. They concluded that "South of the Lochsa River. . . the more highly metamorphosed Precambrian Belt rocks lose some of their layering as they change into schist, probably reducing the availability of nesting ledges like those at Shadow and Fern falls. . . Our observations of nest-site habitat at Shadow and Fern falls and the prevalence of summer sight records in [northern Idaho] suggest that any northern Idaho waterfall on sedimentary rock may meet the requirements of nesting Black Swifts and should be investigated. Additional field work should enhance our knowledge of the distribution of Black Swifts in Idaho." (Levad 2007). The author used quotes from Dumroese, R. K., M. R. Mousseaux, S. H. Sturts, D. A. Stephens, and P. A. Hollick. 2001. Idaho Black Swifts nesting habitat and spacial analysis of records. *Western Birds* 32:218-227.

The proposed activities would have ***no impact*** on this species and it was dropped from detailed study.

Coeur d' Alene salamander

The salamander has been observed (1998, 2002) in tributaries to the Selway River. Potential habitat features are present in the analysis area, however, no activities are proposed in the streams or adjacent riparian habitats. The action alternatives would affect 15-16 acres of the upper portions of RHCAs. The proposed road decommissioning activities would reduce potential future sedimentation into the affected tributaries that empty into the Selway River. The project would have ***no impact*** on this species and it was dropped from detailed analysis.

Common Loon

This species is a Nez Perce National Forest sensitive species. It is found in rivers, pond and lake environments. No ponds or lakes are present in the project area. No harvest activities would occur adjacent to the Selway or Middle Fork of the Clearwater rivers. The proposed activities would have ***no impact*** on this species and it was dropped from detailed study.

Grizzly bear

Despite numerous studies and many reported bear observations, there have been no verifiable sightings of grizzly bears in the last 60 years until an adult male grizzly bear was mistakenly killed by a black bear hunter in September 2007 in the northern mountains of the Bitterroot Ecosystem.

In November 2000, the U.S. Fish and Wildlife Service (FWS) published a Record of Decision (ROD) for a Final Environmental Impact Statement to reintroduce bears in the Bitterroot Ecosystem. The preferred alternative selected in the ROD called for establishment of a nonessential experimental population of grizzlies in the Bitterroot ecosystem under section 10(j) of the Endangered Species Act. The decision was to reintroduce grizzly bears only into the Selway-Bitterroot Wilderness Area unless it was later determined that reintroduction in the Frank Church-River of No Return Wilderness also was appropriate. The State of Idaho sued to block the plan.

The Service is now reevaluating this Record of Decision and is proposing a "No Action" alternative. The U.S. Fish and Wildlife Service proposes to concentrate recovery efforts and resources on existing grizzly bear populations in the lower 48 states and to withdraw its plan to reintroduce grizzly bears into the Bitterroot ecosystem of Idaho and Montana. Public comment on this proposal was received but there has not been a final decision. If the No Action alternative is selected, grizzly bears would not be reintroduced into the Bitterroot ecosystem.

The analysis area falls within the Bitterroot Grizzly Bear Experimental Population Area but outside the Recovery Area. The Bitterroot Grizzly Bear Recovery Area consists of the Selway-Bitterroot Wilderness and the Frank Church-River of No Return Wilderness. The Recovery Area is located within the Experimental Population Area, and is the area where grizzly bear recovery would be emphasized.

Because the FWS is re-considering grizzly reintroduction into the Bitterroot ecosystem, pending State of Idaho litigation if implementation of a reintroduction program is proposed, and since there has been only one verifiable grizzly sighting in the Clearwater basin in the last 60 years, the grizzly will not be further considered in detail in this analysis.

Harlequin duck

Harlequin summer habitat is not expected to be affected by the salvage project. Records of the bird in the river portions along the project area (1 detection in 1995) indicate potential presence. Potential breeding habitat is further upstream on the Selway and Lochsa Rivers. Project activities would not occur in the duck’s habitat, and foraging opportunities would remain available. The project would have ***no impact*** on this species and no further analysis is required.

Long-billed Curlew

Long-billed curlews nest in open short-grass or mixed-prairie habitat with level or slightly rolling topography and in general avoid areas of trees, high-density shrubs, and tall, dense grasses. The non-forested areas in the analysis are limited and do not provide suitable habitat for this species. This project would have ***no impact*** on this species; therefore it was dropped from detailed study.

Mountain Quail

Recent surveys in Idaho indicated mountain quail are commonly found only in the lower Salmon River drainage, particularly the Little Salmon River Canyon of Idaho County (Brennan 1989; Robertson 1989, 1990; Heekin et al. 1995). There is no favorable habitat in the PA for the mountain quail. Therefore, ***no impact*** to the mountain quail or its habitat.

North American Wolverine

Year-round habitat is at high elevation, in or above tree line, basins and rock chutes that have sources of food for the wolverine. Deep and persistent snow habitats with reliable snow cover lasting through mid-April to May is the best predictor of wolverine occurrence (USFWS 2013, 2014). The PA lacks such habitat. No modelled habitat was shown by GIS models and no occurrence of the wolverine has been recorded in the project area. This project would have ***no impact*** on the wolverine.

Pygmy Nuthatch

In Idaho, the pygmy nuthatch has a state ranking of S1 (critically imperiled). The nuthatch is mostly associated with ponderosa pine forests and woodlands, the bird nests in dead pines and live trees with dead sections, it prefers old-growth, mature, undisturbed forests (Szaro and Balda 1986). Modelled habitat was 20 acres, proposed harvest activities would affect 0.5 acres. No pygmy nuthatches detections have occurred in the project area. Only one modelled patch of habitat was of size to be a home range of 4-10 acres. The small representation of habitat in the PA, only one patch would fit the size of a potential home range, and no records of the bird leads to a determination that the project would have ***no impact*** on the pygmy nuthatch.

Ring-neck Snake

In west–central Idaho, ring-necked snakes are typically found adjacent to perennial rivers or streams in grassland or forested habitats (IDFG 2005). It is known to use forested and brushy areas or open hillsides with rocks or other debris to hide in, and may even use moist microhabitats (Storm and Leonard 1995). The snake is nocturnal and hides underground or under surface cover during the day.

Modelled habitat (VRU3) showed about 192 acres on the west side of the Selway River, near the confluence with the Lochsa River. No detections of the snake have occurred in this area. None of the action alternatives in the proposed project would impact any habitat for the snake. This salvage project would cause ***no impact*** to the ring-neck snake.

Townsend's Big-eared Bat

Townsend observations have been confirmed on both the Clearwater and Moose Creek Ranger Districts. Romin and Bosworth (2010) found this bat just northeast of the analysis area on the Moose Creek Ranger District along the Selway River in the vicinity of Goddard Creek.

Perkins (1992) surveyed some of the most suitable hibernacula and maternity/nursery roost sites on the Nez Perce Forest during summer and winter without finding any recent evidence or presence of Townsend's big-eared bat on the Forest. He suggested that their occurrence on the forest is peripheral and does not involve reproductive activities. The probable occurrence of this bat outside the Salmon and Snake River riparian areas is extremely low and initial population indicators suggest less than 10 on the Forest (Perkins).

Because the PA does not have cave habitat, it is unlikely that Townsend's big-eared bats use snags as day or night roosting habitat or forage in the area. For this reason, they were dropped from detailed analysis and the project would have ***no impact*** on this bat.

Western Toad

The toad is found in a variety of habitats but lives in or near water. Western toads eat a variety of insects and have been found in burned over areas (Guscio et al. 2007). GIS modelling calculated about 4,620 acres of potential toad habitat- all in riparian areas. No harvest units from any of the action alternatives would affect modelled toad habitat. Wildlife occurrence databases revealed no records of western toads in the Project area.

The effects of the Johnson Bar fire would likely create a pulse of insect activity in the post-burned locations that would be favorable for toads to forage on. For this reason, the western toad was dropped from detailed analysis and the project would have ***no impact*** on this amphibian.

White-headed Woodpecker

In Idaho all observations of the woodpeckers were in mature and old stands of mixed ponderosa pine and Douglas-fir with open canopies and relatively low density of trees (Frederick and Moore 1991). Bull et al. (1986) noted that only ponderosa pine and ponderosa pine forest types were used as foraging areas by white-headed woodpeckers. White-headed woodpeckers forage on insects such as ants, wood boring beetles, spiders, and fly larvae gleaned from tree bark, branches, and foliage from May to September (Blair and Servheen 1995). Potential white-headed woodpecker habitat was analyzed from GIS models. Only 15 acres were detected, and of this, proposed salvage harvest units would affect ½ acre in all action alternatives. With minimal acres present and the potential modification of 0.5 acres, the project would have an immeasurable impact to the woodpecker. No observations of the woodpecker haveoccurred in the PA. The proposed project activities would have ***no impact*** to the white-headed woodpecker.

APPENDIX F

Roads

Roads

Road Decommissioning

Roads identified in this document for decommissioning are not needed for future land management activities. Roads are categorized as system or non-system roads. System roads are part of the inventoried Forest Service road system and are currently maintained for management activities. Non-system roads are not part of the inventoried Forest Service road system and are not maintained to any standard. These roads were identified through imagery (LiDAR) and ground surveys. Non-system roads are not open to public access and are typically grown over with trees and inaccessible. Non-system roads in this document are identified by JB-#.

Road decommissioning practices vary depending on the road location and the risk of road failure and are specific for each road. Practices vary from full recontour of the road back to natural slope to road abandonment which requires no ground disturbing activities.

Roads that have moderate to high risk of failure, that are near fish bearing streams or are being used by unauthorized vehicles would require full decompaction and natural slope recontour. All roads with stream crossings, heavy compaction from traffic or other watershed concerns would be recontoured including stream grade channel restoration. Roads identified in this project not meeting the above criteria may be abandoned. Abandoned roads typically require no stream crossing restoration, are well vegetated, are resistant to surface erosion and are not prone to mass failure. During implementation system and non-system roads are held to the same standards for decommissioning.

Road Storage

Roads identified in this document for road storage are needed for future land management activities but would not be used for access for an extended amount of time. Roads placed in storage do not require regular maintenance reducing funding required in order to maintain the Forest Service road system. Road storage practices vary depending on the risk of road failure and future access requirements. Practices vary from removal of culverts and addition of water bars to accommodate hydraulic flows to road closure devises to close the road to vehicle traffic. Each road placed into storage shall have a specific prescription designed to protect the watershed for the duration of road storage.

Road Maintenance

Each road used for timber haul in accordance with this project would be maintained or brought to standard for the road use. Roads will be either reconditioned or reconstructed before the start of the project based on the existing condition of the roadway. Road would also be maintained to standard throughout the project for safe traffic movement and protection of the watershed.

Reconditioning roads consists of standard maintenance, such as road blading, brushing, removal of small cut slope failures, small shoulder repair, applying rock in wet areas and removal of obstructions such as rocks and trees. Reconditioning also includes maintenance of existing culverts and installation of drainage dips.

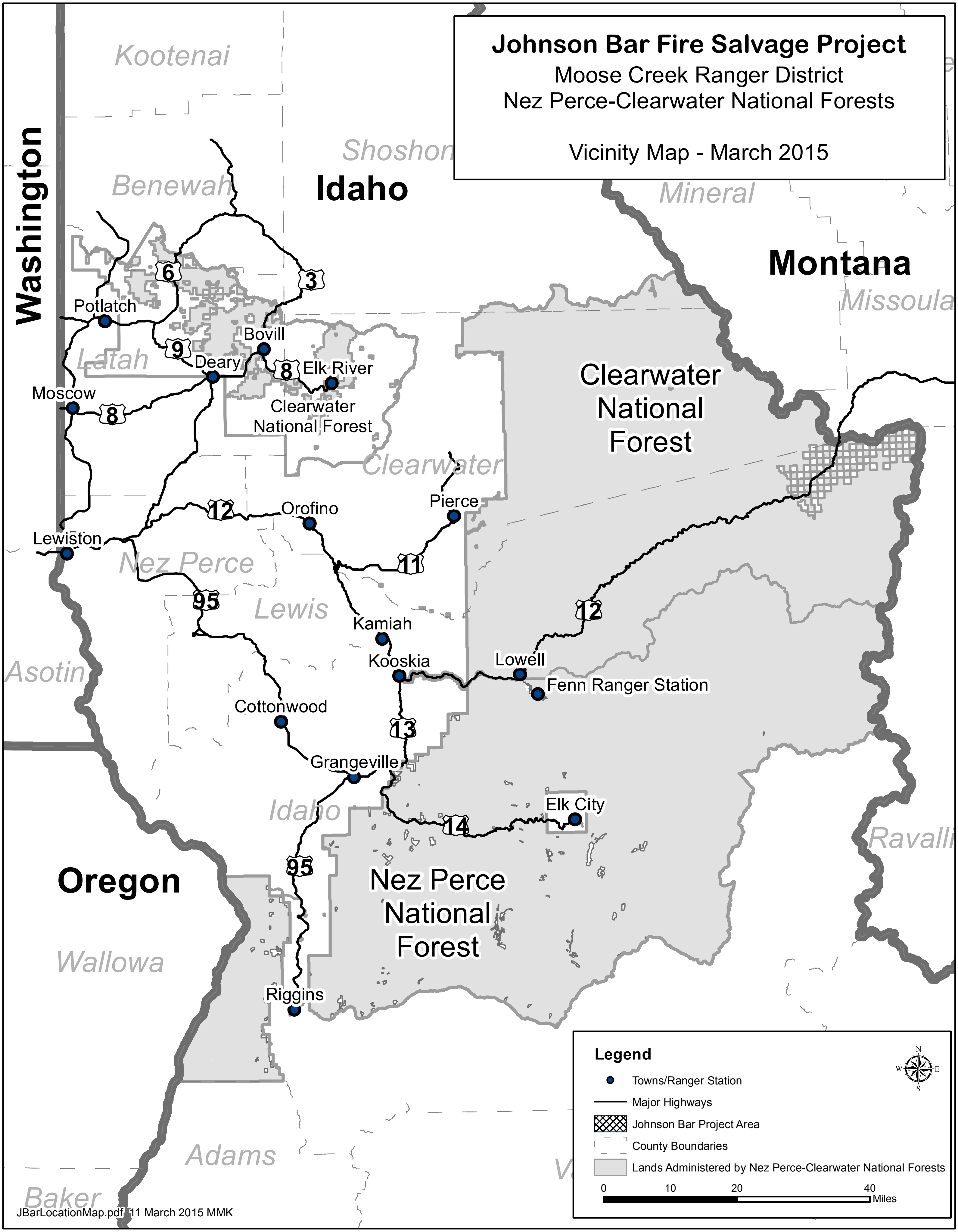
Reconstruction of a roadway improves the roadway to bring it to required standards for haul. This includes replacing and installing new culverts for cross drains and live water culverts, placement of rock surfacing, placement of roadway fill, road realignment due to failures and installation of new signs or gates. Other activities may include installation of drainage dips, road blading, brushing and removal of obstructions.

The definitions above do not include all activities that can be completed under each classification; these definitions are for informational purposes only.

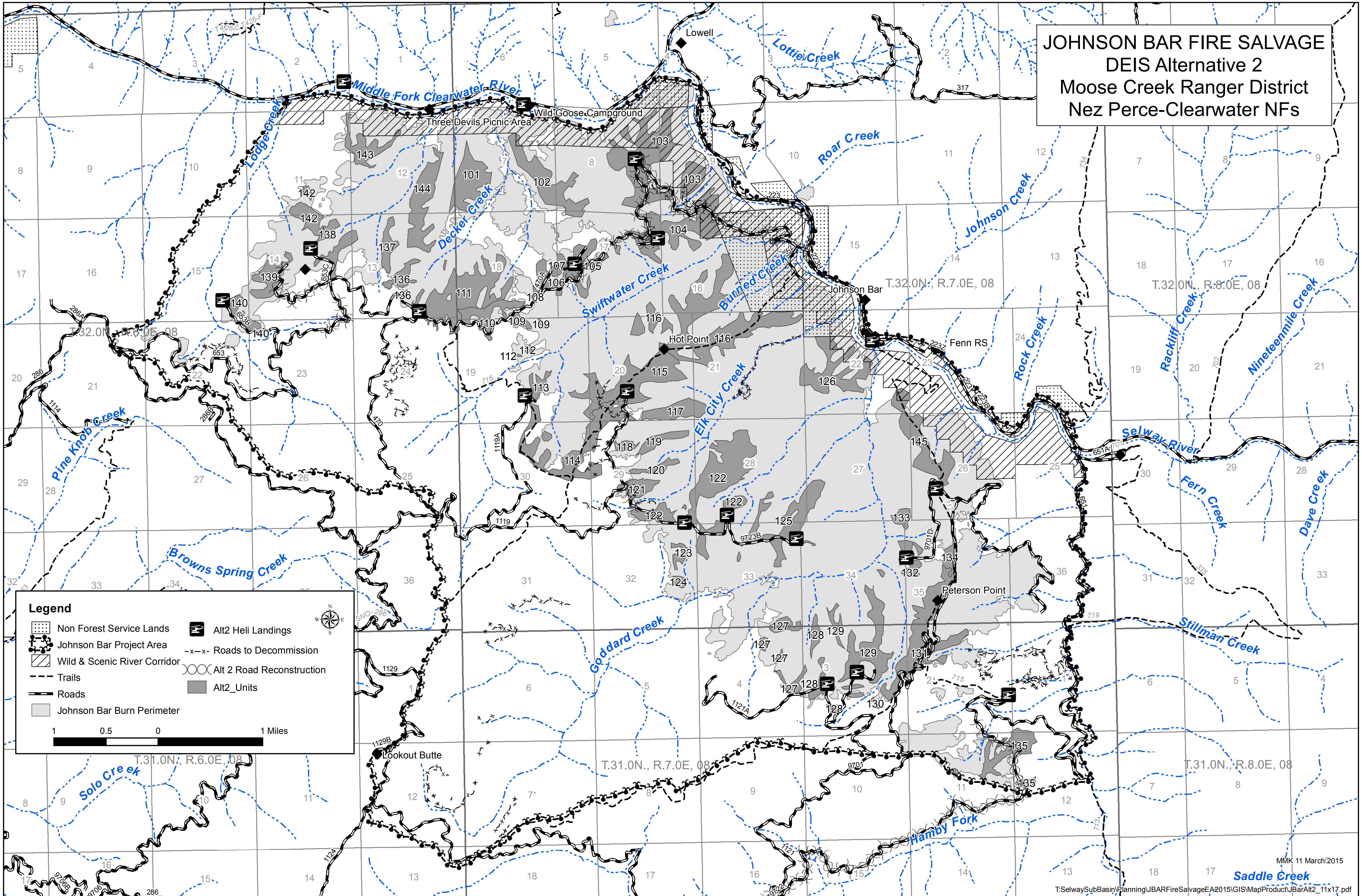
Below is a list of roads requiring road maintenance based on proposed use and the current condition of the roadway. As the project continues, road failures or different access may require the type of work and roads requiring work to change. This is an approximation of road work for the Johnson Bar Salvage Project.

APPENDIX G

Maps



Johnson Bar Fire Salvage Project
Moose Creek Ranger District
Nez Perce-Clearwater National Forests
Vicinity Map - March 2015
Washington
Idaho
Montana
Oregon
Kootenai
Shoshon
Benewah
Mineral
Missoula
Latah
Clearwater
Nez Perce
Lewis
Asotin
Idaho
Ravalli
Wallowa
Adams
Baker
Clearwater National Forest
Nez Perce National Forest
Potlatch
Bovill
Deary
Elk River
Moscow
Orofino
Pierce
Lewiston
Kamiah
Kooskia
Lowell
Fenn Ranger Station
Cottonwood
Grangeville
Elk City
Riggins
6
3
9
8
12
11
95
13
14
Legend
Towns/Ranger Station
Major Highways
Johnson Bar Project Area
County Boundaries
Lands Administered by Nez Perce-Clearwater National Forests
0
10
20
40
Miles
N
S
E
W
JBarLocationMap.pdf 11 March 2015 MMK



JOHNSON BAR FIRE SALVAGE
DEIS Alternative 2
Moose Creek Ranger District
Nez Perce-Clearwater NFs
Legend
Non Forest Service Lands
Johnson Bar Project Area
Wild & Scenic River Corridor
Trails
Roads
Johnson Bar Burn Perimeter
Alt2 Heli Landings
Roads to Decommission
Alt 2 Road Reconstruction
Alt2_Units
1 0.5 0 1 Miles
Middle Fork Clearwater River
Selway River
Lowell
Wild Goose Campground
Three Devils Picnic Area
Johnson Bar
Fenn RS
Hot Point
Peterson Point
Lookout Butte
Lodge Creek
Lottie Creek
Roar Creek
Johnson Creek
Decker Creek
Swiftwater Creek
Burned Creek
Elk City Creek
Rock Creek
Rackliff Creek
Nineteenmile Creek
Pine Knob Creek
Browns Spring Creek
Goddard Creek
Fern Creek
Dave Creek
Stillman Creek
Solo Creek
Hamby Fork
Saddle Creek
T.32.0N., R.6.0E, 08
T.32.0N., R.7.0E, 08
T.32.0N., R.8.0E, 08
T.31.0N., R.6.0E, 08
T.31.0N., R.7.0E, 08
T.31.0N., R.8.0E, 08
MMK 11 March 2015
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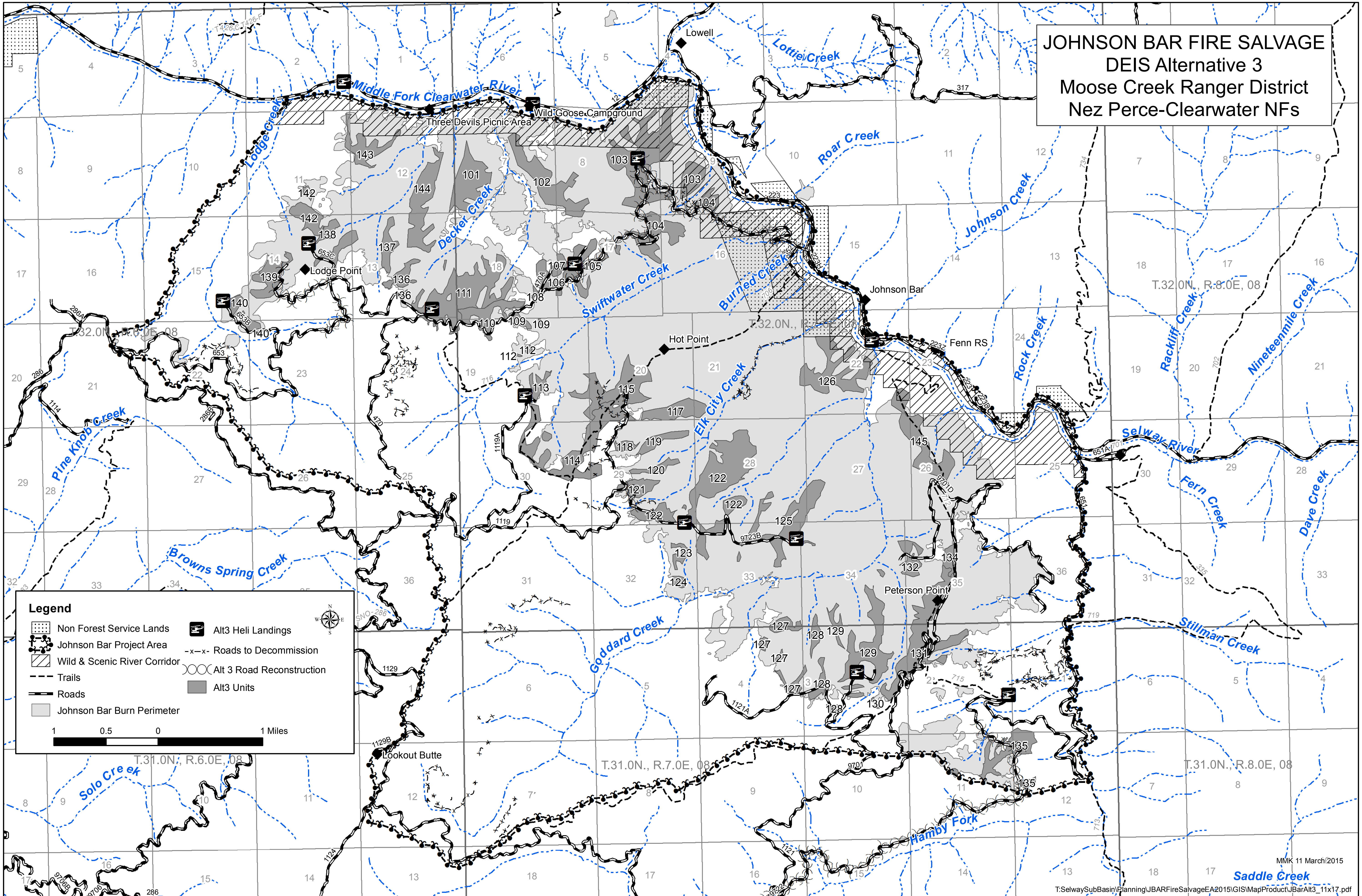
JOHNSON BAR FIRE SALVAGE
DEIS Alternative 3
Moose Creek Ranger District
Nez Perce-Clearwater NFs
Legend
Non Forest Service Lands
Johnson Bar Project Area
Wild & Scenic River Corridor
Trails
Roads
Johnson Bar Burn Perimeter
Alt3 Heli Landings
Roads to Decommission
Alt 3 Road Reconstruction
Alt3 Units
1 0.5 0 1 Miles
Middle Fork Clearwater River
Selway River
Lowell
Johnson Bar
Fenn RS
Hot Point
Lodge Point
Peterson Point
Lookout Butte
Three Devils Picnic Area
Wild Goose Campground
T.32.0N., R.8.0E, 08
T.32.0N., R.6.0E, 08
T.31.0N., R.6.0E, 08
T.31.0N., R.7.0E, 08
T.31.0N., R.8.0E, 08
MMK 11 March 2015
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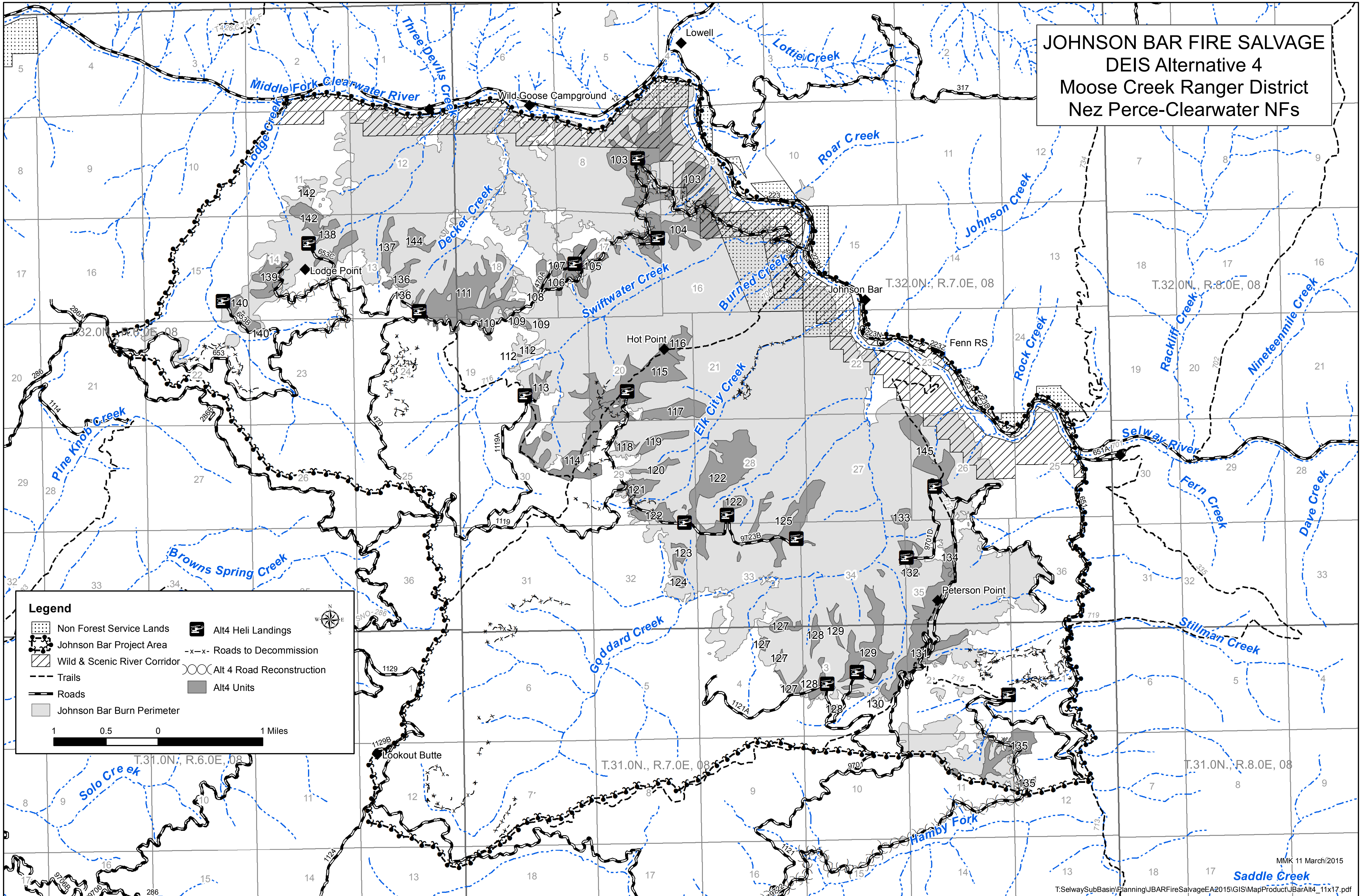
JOHNSON BAR FIRE SALVAGE
DEIS Alternative 4
Moose Creek Ranger District
Nez Perce-Clearwater NFs
Legend
Non Forest Service Lands
Johnson Bar Project Area
Wild & Scenic River Corridor
Trails
Roads
Johnson Bar Burn Perimeter
Alt4 Heli Landings
Roads to Decommission
Alt 4 Road Reconstruction
Alt4 Units
1 0.5 0 1 Miles
Middle Fork Clearwater River
Three Devils Creek
Wild Goose Campground
Lowell
Lottie Creek
Roar Creek
Johnson Creek
Lodge Creek
Decker Creek
Swiftwater Creek
Burned Creek
Johnson Bar
Fenn RS
Rock Creek
Rackliff Creek
Nineteenmile Creek
Selway River
Fern Creek
Dave Creek
Stillman Creek
Lodge Point
Hot Point
Elk City Creek
Pine Knob Creek
Browns Spring Creek
Goddard Creek
Peterson Point
Lookout Butte
Solo Creek
Hamby Fork
Saddle Creek
T.32.0N., R.6.0E, 08
T.32.0N., R.7.0E, 08
T.32.0N., R.8.0E, 08
T.31.0N., R.6.0E, 08
T.31.0N., R.7.0E, 08
T.31.0N., R.8.0E, 08
MMK 11 March 2015
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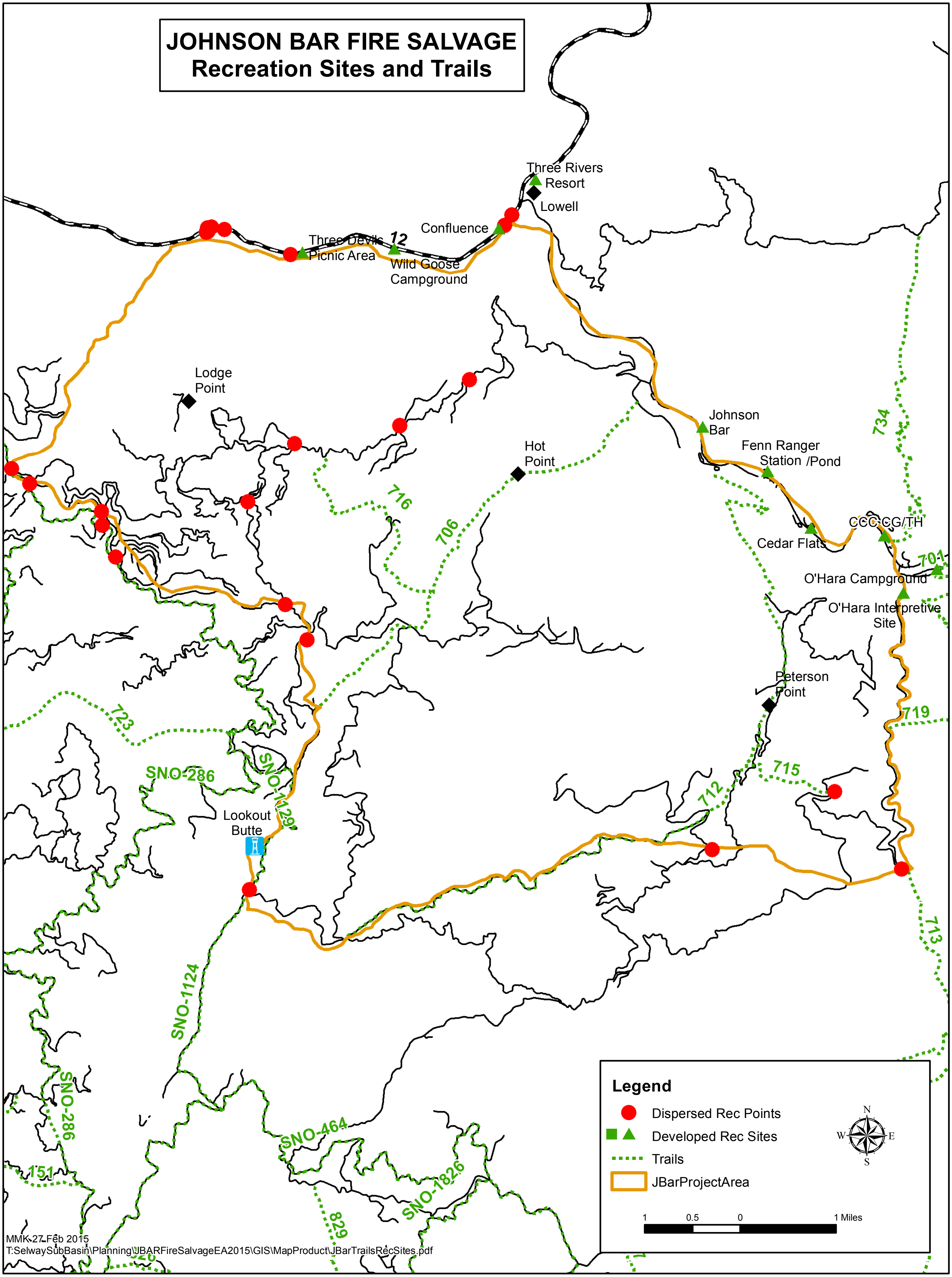
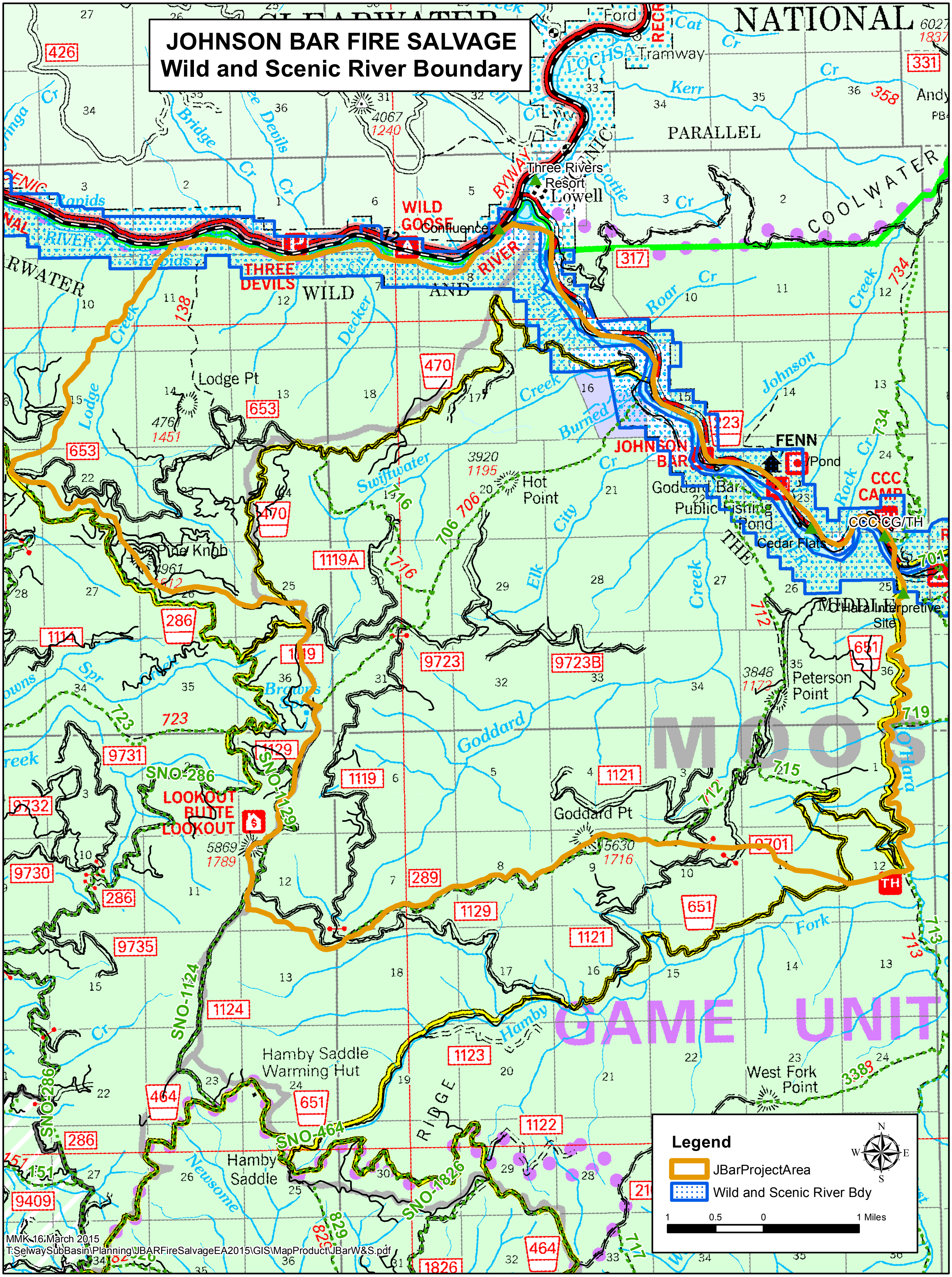

JOHNSON BAR FIRE SALVAGE
Recreation Sites and Trails
Three Rivers Resort
Lowell
Confluence
Three Devils Picnic Area
12
Wild Goose Campground
Lodge Point
Hot Point
Johnson Bar
Fenn Ranger Station /Pond
CCC CG/TH
Cedar Flats
O'Hara Campground
O'Hara Interpretive Site
Peterson Point
Lookout Butte
716
706
734
701
719
715
712
713
723
SNO-286
SNO-1129
SNO-1124
SNO-464
SNO-1826
829
151
Legend
Dispersed Rec Points
Developed Rec Sites
Trails
JBarProjectArea
N
W
E
S
1
0.5
0
1 Miles
MMK 27 Feb 2015
T:SelwaySubBasin\Planning\JBARFireSalvageEA2015\GIS\MapProduct\JBarTrailsRecSites.pdf

JOHNSON BAR FIRE SALVAGE
Wild and Scenic River Boundary



Appendix H

Unit Acres by Alternative

JOHNSON BAR DEIS UNIT ACRES by ALTERNATIVE **Appendix H**

UNIT	Alternative 2			Alternative 3			Alternative 4		
	Acres	Temp Road (miles) 1/	Logging System 2/	Acres	Temp Road (miles) 1/	Logging System 2/	Acres	Temp Road (miles) 1/	Logging System 2/
101	83		H	83		H	0		
102	101		H	101		H	0		
103	221	.07 Exist	T, S, H	221	.05 exist	S, H	221	.05 Exist .28 new	T, S, H
104	138	.32 exist	T, S, H	87		S	138	.32 exist	T, S, H
105	26		T, S	26		S	26		T, S
106	61		T, S	61		S	61		T, S
107	11		T, S	11		T, S	11		T, S
108	4	.04 new	T, S	4	.04 new	S	4	.04 new	T, S
109	13		S	13		S	13		S
110	49		T, S	49		S,H	49		T, S
111	173	.81 new	T, S, H	173	.12 new	T, S, H	173	1.07 new	T, S, H
112	3		S	3		S	3		S
113	16		S, H	16		S, H	16		S, H
114	150	.22 exist 1.06 new	T, S, H	150	.22 exist	S, H	150	.22 exist 1.06 new	T, S, H
115	153		S, H	101		S, H	153		S, H
116	277		H	0			25		H
117	52		S, H	52		S, H	52		S, H
118	10		S	10		S	10		S
119	24		H	24		H	24		H
120	17		S, H	17		S, H	17		S, H
121	28		T, S	28		S	28		T, S
122	219	.11 new	T, S, H	219		S, H	219	.11 new	T, S, H
123	12		H	12		H	12		H
124	6		H	6		H	6		H
125	108	.20 new	T, S, H	108		S, H	108	.20 new	T, S, H
126	102		H	102		H	0		
127	42		S, H	42		S, H	42		S, H
128	36		T, S, H	36		S, H	36		T, S, H
129	123	.15 new	T, S, H	123		S, H	123	.15 new	T, S, H
130	2		H	2		H	2		H
131	144	.08 exist .49 new	T, S	144	.08 exist	S,H	144	.08 exist .49 new	T, S
132	26		S	26		S,H	26		S
133	15		H	0			15		H
134	18	.05 new	T, S	18		S,H	18	.05 new	T, S
135	67		S, H	67		S, H	67		S, H
136	25	.18 new	S	25		S	25	.18 new	S
137	27		H	27		H	27		H
138	44		S, H	44		S, H	44		S, H
139	49	.12 exist	S	49	.12 exist	S	49	.12 exist	S
140	22		H	22		H	22		
142	39		H	39		H	39		H
143	46		H	46		H	0		

UNIT	Alternative 2			Alternative 3			Alternative 4		
	Acres	**Temp Road (miles) 1/**	**Logging System 2/**	**Acres**	**Temp Road (miles) 1/**	**Logging System 2/**	**Acres**	**Temp Road (miles) 1/**	**Logging System 2/**
144	93		H	93		H	21		H
145	98		S, H	98		S, H	78		S, H
	2973	0.81 exist 3.09 new	T = 7% S = 44% H = 49%	2580	0.47 exist 0.16 new	T = 1% S = 40% H = 59%	2298	0.79 exist 3.75 new	T = 9% S = 57% H = 34%

1/ Temporary Roads: Exist = existing road template; New = new construction.

2/ Logging system designators: T = Tractor, S = Skyline, H = Helicopter